







Digitized by the Internet Archive  
in 2013

<http://archive.org/details/climatologicalda04unit>



















U. S. DEPARTMENT OF COMMERCE

SINCLAIR WEEKS, Secretary

WEATHER BUREAU

F. W. REICHELDERFER, Chief

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

JANUARY 1953

Volume 4 No. 1



ASHEVILLE: 1953

## C O N T E N T S

SURFACE DATA	Page
General Summary of Weather Conditions-----	1
Condensed Climatological Data - States-----	3
Climatological Data - Stations-----	4
Heating Degree Days-----	9
Severe Storms-----	10
General Summary of River and Flood Conditions-----	16
Flood Stage Data-----	18
UPPER AIR DATA	
Radiosonde Data-----	19
Pilot Balloon Data-----	22
Rawin Data-----	23
SOLAR RADIATION DATA	
Solar Radiation Intensities-----	24
Blue Hill Data-----	25
Daily Totals and Average Daily Totals by Weeks-----	26
Daily Illumination on a Horizontal Surface-----	28
CHARTS I-XV	

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

SUBSCRIPTION PRICE: Monthly and annual, 15 cents per copy; yearly subscription, including monthly and annual issues, \$1.50. Checks and money orders should be made payable to the "Treasurer of the United States." Remittance and correspondence regarding subscriptions should be sent to "Superintendent of Documents, Government Printing Office, Washington 25, D. C."



# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

Volume 4 No. 1

JANUARY 1953

### GENERAL SUMMARY OF WEATHER CONDITIONS

January weather was featured mainly by unseasonably mild temperatures. The Nation-wide average temperature was 1° higher than that of any other January in the last 61 years. In the North and East barometric pressure was unusually low, precipitation frequent, and cloudiness persistent. In the northeastern quarter of the Country, there were also frequent periods of freezing rain or drizzle and fog. Thunderstorms were more frequent than usual for January in the lower Mississippi Valley and Southeast and occurred in many northern sections where thunderstorms rarely occur in January. Wind movement was high in the Northwest, averaging 12.5 m.p.h. (a new record) at Spokane, Wash., and 20.9 m.p.h. at Cheyenne, Wyo., (second highest on record). Owing to much cloudiness, sunshine was greatly deficient in the North and East, with some stations recording the lowest monthly amount on record, but in the lower Great Plains sunshine was abundant, with Brownsville, Tex., receiving nearly twice the normal amount for January. Precipitation was unusually heavy in the Pacific Northwest and in many sections east of the Mississippi River, but was again deficient in the lower Great Plains where in many sections soil moisture remained short, ponds and streams low, and grains and pastures in poor condition.

**TEMPERATURE.**—Temperatures averaged above normal everywhere, except in the Florida Peninsula where they were slightly below normal. This January was warmer in most sections than the average December or February and only a few degrees colder than the average November or March.

The greatest excess of temperature occurred in northern interior sections west of the Continental Divide where average plus departures from normal ranged up to 16°. State-wide averages for January were the highest on record for Washington, Idaho, California, Nevada, Utah, and Wyoming, and were among the highest for Arizona, New Mexico, and Montana. The northern portion of this region was under the influence of relatively warm maritime winds most of the month. At many stations the January minima were the highest on record, as were also the January maxima. In Washington no station reported a minimum as low as zero. At Grandview, Idaho, the maximum reached 70°, the highest temperature recorded in the State during any January since 1901. At Red Bluff, Calif., for the first time in January since 1885, the minimum temperature did not fall as low as freezing. A few of the cities that experienced the warmest January on record included San Diego, Calif.; Phoenix, Ariz.; Salt Lake City, Utah, where the average temperature for the month exceeded the previous record by 3.0°; Spokane and Seattle, Wash.; Helena, Mont.; and Cheyenne, Wyo.

The month was unusually warm in the Northeast for the 5th consecutive January, and daily averages were above normal most of the time. This was only the 6th January on record in West Virginia that no station recorded a minimum temperature as low as zero during the month.

There were no well defined periods of highest

temperatures in most areas, although many stations east of the Mississippi recorded their highest on the 15th or 16th, and many in central and northern sections between the Mississippi and the Rockies from the 9th through the 12th. The highest temperature of the month, 92°, was recorded at El Cajon, Calif., on the 11th.

The coldest weather of the month between the Mississippi and the Continental Divide and also in Utah, eastern Idaho, and western portions of Colorado and Wyoming occurred from the 14th to the 18th, at most stations in the far West during the first or last week, and east of the Mississippi River from the 4th to the 6th, except that at most stations in the upper Lake Region and Middle Atlantic and New England States the lowest readings occurred during the last 5 days. Subzero minima were generally limited to the north-central interior, far western interior, Lake Region, and extreme Northeast. During the cold spell in central areas on the 15th and 16th freezing occurred southward to the Eagle Pass and Winter Garden sections of Texas, but caused little or no damage. In the Southeast freezing occurred to the Gulf Coast on the 4th and 12th and extended as far south as the Everglades of Florida on the 6th, and the Fort Myers area on the 26th and 27th. The lowest temperature of the month was -45° at Thoen, Mont., on the 15th.

**PRECIPITATION.**—Precipitation was unusually heavy in many northern sections west of the Continental Divide. State-wide averages for Washington and Oregon were the highest on record and monthly totals at several stations exceeded 40 inches, with 47.23 inches at Valsetz, Oreg., which established a new January record for the State. Seattle and Spokane, Wash., measured record January totals of 10.93 and 4.56 inches, respectively, and Salt Lake City, Utah, received 3.90 inches which equaled the previous record total for January. Rainfall was frequent along the north Pacific Coast, occurring on 27 days at Seattle, Wash., and also was occasionally heavy, measuring 9.82 inches at Klamath, Calif., on the 17th. In northern California and western Oregon these rains caused destructive floods with losses totaling millions of dollars. At Medford, Oreg., the Rogue River on the 8th reached its highest stage since 1927. This generous precipitation supplied beneficial soil moisture throughout the Pacific Northwest and with the additional effect of mild temperatures greatly benefited small grains and other vegetation, which were beyond their normal development for the season at the end of the month.

In the Atlantic Coastal States and the States immediately west of the Appalachians, precipitation was well above normal, the amounts being abnormally heavy in the eastern portions of the New England and Middle Atlantic States and northern Alabama where monthly totals ranged up to 9 inches or more. Light flooding occurred in Alabama, causing losses of \$169,000. In Massachusetts, Connecticut, and Rhode Island monthly precipitation as reported by 163 stations ranged from 4.55 to 8.54 inches. It was the wettest January on record at Providence,



## GENERAL SUMMARY OF WEATHER CONDITIONS--Continued

JANUARY 1953

R. I., and Nantucket, Mass. Soil moisture was ample throughout the East at the end of the month.

The most important precipitation deficiencies occurred in the western portion of the central and lower Great Plains where the soil remained extremely dry in many sections. Fall-sown grains were in poor condition, and ponds and streams were low or dry. Owing to the poor condition of ranges, heavy supplemental feeding of livestock was necessary.

**SNOWFALL.**--Snowfall was generally below normal and the ground was bare most of the month, except in the mountainous and extreme northern sections and during the first few days in the central Great Plains. The only outstanding snowstorm occurred on the 14th along the east side of Great Salt Lake Valley and over the adjacent western slopes of the Wasatch Mountains in Utah. On that date a snowfall of 14.7 inches at Salt Lake City established a new 24-hour record. Roofs caved in, trees and shrubs were damaged, and power supply and communications were interrupted over a wide area. The worst snowstorm in the north-central interior occurred on the 15th, when blizzard conditions prevailed in South Dakota and near blizzard conditions in some localities of Minnesota and Wisconsin.

**DESTRUCTIVE STORMS.**--Widespread glaze on several occasions in the northeastern quarter of the Country, several tornadoes in the southeastern quarter, and four severe windstorms accounted for most of the month's storm losses.

The most destructive weather element was glaze, which was unusually heavy from the 7th through the 11th in parts of central and southern New England, southeastern New York, the northern third of New Jersey, and over the eastern ridges of the Appalachian Mountains in Pennsylvania and Maryland. The long duration and in some localities the severity of this storm have seldom if ever been exceeded. Locally in Carbon and Monroe Counties, Pa., the

coat of ice was reported to be over 4 inches thick, and near McConnellsburg, 2 days after the storm, a 15-inch length of ice-coated wire weighed 2 pounds. In Garrett County, Md., immediately south of the Pennsylvania-Maryland line, the ice load on wires was 4 pounds per foot according to reports. Several persons were killed or injured in the many traffic and other accidents due to slippery pavements. Many towns and thousands of homes were without electricity or communications for periods ranging up to 5 days. Damage was principally to overhead wires, although fruit and forest trees also suffered heavily. Damage was estimated at \$2,500,000 in New England, \$1,500,000 in New Jersey, and \$100,000 in Maryland. Total losses in New York and Pennsylvania were heavy, but the monetary values have not yet been determined.

High winds and heavy rains in the Northwest from the 7th through the 9th caused widespread, though mostly minor damage in Washington, Oregon, western and northern Idaho, and the western half of Montana, that totaled \$95,000 in Washington and over \$1,000,000 in Oregon. Wind speeds ranged up to 100 m.p.h. along the coast and up to 70 m.p.h. in the interior. High winds and heavy rains in western Oregon again on the 19th and 20th caused damage along the coast and in the Corvallis area that was roughly estimated at \$750,000. Wind speeds in the Corvallis area were estimated to be over 100 m.p.h. During a thundersquall in the Houston, Tex., area on the 31st, peak wind gusts reached 88 m.p.h. at the Houston Airport and caused damage estimated at \$200,000. Winds at Sarasota, Fla., on the 9th, damaged property to the extent of \$300,000.

Tornadoes were about three times as numerous as usual for January, but estimated losses were below average and no deaths were reported from this cause.

# CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

JANUARY 1953

Section	Temperature								Precipitation							
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes					
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least		
	"F.	"F.		"F.			"F.		In	In.		In.			In.	
Alabama	50.2	+3.3	Ozark	80	17	2 Stations	19	4	5.55	+0.52	Leeds	9.36	Tuskegee		1.82	
Arizona	46.0	+5.3	Tucson-Campbell Exp. Sta.	90	10	Maverick	-9		.28	-.73	Bright Angel RS	1.87	21 Stations		.00	
Arkansas	45.2	+4.0	2 Stations	77	7	2 Stations	7	16	3.66	-.78	Crystal Valley	7.97	Siloam Springs		1.01	
California	49.0	+5.3	El Cajon-Yale Rch.	92	11	Soda Springs	-7	27	4.45	+4.47	Gasquet RS	36.63	13 Stations		.00	
Colorado	31.7	+8.4	Arriba	78	12	Taylor Park	-38	16	.64	-.29	Steamboat Springs	4.08	5 Stations		.00	
Connecticut	32.1	+5.0	Waterbury	59	24	Norfolk 2SW	4	27	6.44	+2.57	Norwich SSW	7.99	Bridgeport WB AP		4.55	
Delaware	39.6	+4.5	3 Stations	70	16	Millsboro	16	30	4.51	+9.32	Newark Coll. Farm	5.96	Georgetown		3.22	
Florida	60.3	+1.1	Stuart	87	23	3 Stations	23	4	3.38	-.67	Long Boat Key	7.86	Titusville		1.33	
Georgia	50.9	+2.6	Bainbridge	81	8	do	19	4	4.47	+3.39	Suches	13.12	Brunswick CAA AP		1.26	
Idaho	35.3	+11.8	Grand View	70	9	2 Stations	-8	9	3.98	+1.97	Roland-West Portal	14.59	Chilly-Barton Flat		.15	
Illinois	32.0	+4.3	2 Stations	69	26	Kankakee 4W	-12	6	1.86	-.47	Brookport Dam	5.33	Galena		.57	
Indiana	33.4	+4.7	Salem	69	15	Valparaiso	-10	6	3.07	+1.07	North Vernon	6.30	Whiting		.99	
Iowa	22.5	+2.8	2 Stations	61	15	3 Stations	-24	16	.76	-.25	Boone	2.35	Independence 2W		.13	
Kansas	36.7	+6.4	Oakley	82	12	Oberlin	-12	16	.19	-.47	Oswego	1.22	Russell Springs		.00	
Kentucky	41.3	+5.2	2 Stations	70	15	Farmers	8	6	4.65	+0.07	Burkesville	7.07	Greensburg Hwy 61 BR		2.72	
Louisiana	54.4	+3.3	Angola	82	20	Pine Grove Tower	21	12	3.18	-1.86	Luna Fire Tower	6.77	Hackberry		.88	
Maine	23.8	+6.6	2 Stations	54	16	Fort Kent ISE	-21	10	4.18	+8.81	Bellast	6.57	Fort Kent ISE		2.18	
Maryland	39.3	+5.7	Ocean City	75	16	Oakland	2	4	4.41	+1.04	Shallmar	6.51	Pocomoke City 4SW		2.77	
Massachusetts	31.8	+5.2	Plymouth	61	16	West Cummington	-3	5	6.21	+2.49	New Salem	8.54	Pittsfield WB AP		4.77	
Michigan	25.0	+4.9	Detroit WB AP W.Run	59	15	Pellston CAA AP	-27	26	1.84	+0.04	Deer Park	4.94	Standish		.72	
Minnesota	12.8	+4.0	Tracy Power Plant	47	12	Big Falls Ranger Sta.	-40	16	.95	+2.21	Campbell	1.97	Moorhead St. Teach.		.12	
Mississippi	50.9	+3.3	6 Stations	79	7	Ripley	19	4	4.46	-.78	Macon 2NE	7.50	Biloxi Display		1.41	
Missouri	35.2	+4.4	Ozark Beach	75	26	Maryville	-10	16	1.57	-.74	Sikeston Crop Exp.Fm	4.51	Fairfax		T	
Montana	28.6	+10.1	Billings Water Pit.	72	11	Thoeny	-45	15	1.34	+6.61	Summit	14.00	2 Stations		.00	
Nebraska	30.2	+7.0	Enders Dam	72	27	Walthill	-24	16	.43	-.12	Clarkson	2.05	3 Stations		.00	
Nevada	39.9	+9.2	N. Las Vegas-Doxarm	77	25	Fish Creek Rch.	-5	5	.55	-.51	Glenbrook	3.31	4 Stations		.00	
New Hampshire	25.5	+6.2	4 Stations	55	16	First Conn. Lake	-23	8	4.67	+1.63	MacDowell Dam	7.66	Whitefield		1.96	
New Jersey	36.1	+5.0	Belleplain	70	16	Layton 3NW	7	30	5.32	+1.67	Paterson	7.44	Cape May 3W		3.21	
New Mexico	40.6	+7.1	Maxwell	89	10	Gavilan	-19	4	.15	-.47	Batemans Ranch	1.27	50 Stations		.00	
New York	28.4	+5.1	2 Stations	63	16	Paul Smith's	-18	8	3.36	+4.45	Slide Mt.	8.47	Lawrenceville		1.17	
North Carolina	46.4	+4.0	7 Stations	76	16	Mt. Mitchell	2	4	3.78	+1.13	Highlands	14.77	Rocky Mount 8ESE		1.15	
North Dakota	14.2	+7.3	Marmarth	60	12	2 Stations	-31	15	.43	-.05	Williston WB City	1.00	Enderlin		.07	
Ohio	34.7	+5.5	Cincinnati-Hartwell	68	15	Mansfield 6W	-6	6	3.82	+8.84	Chillicothe	7.04	Toledo Blade		1.59	
Oklahoma	43.8	+5.8	2 Stations	83	12	2 Stations	1	17	.63	-.92	Kiamichi Tower	3.61	Boise City		.00	
Oregon	41.0	+9.3	Adrian	70	9	Seneca	-2	5	8.32	+4.44	Valsetz	47.23	00 Ranch		.19	
Pennsylvania	33.6	+5.0	Hanover	67	25	Pleasant Mt. 1W	0	27	4.32	+1.10	Palm	7.01	Le Roy		1.58	
Rhode Island	34.6	+4.8	Providence WB City	59	16	Kingston	5	2	6.57	+2.55	Austin	7.13	Kingston		6.14	
South Carolina	49.3	+3.0	2 Stations	78	18	Caesars Head	15	4	3.20	-.23	Sassafras Mt.	9.95	Pinopolis Dam		.87	
South Dakota	23.4	+6.3	Moenville	75	12	Mellette	-30	15	.61	+0.06	Deadwood	2.73	Scenic		.02	
Tennessee	44.5	+5.1	2 Stations	74	15	Allardt	15	6	5.31	+2.25	Haw Knob	12.01	Newbern		2.60	
Texas	52.4	+5.4	Laredo WB AP	90	97	Seymour	5	17	.63	-.97	Carthage	6.03	Numerous stations		.00	
Utah	34.1	+9.3	St. George PH	69	25	Jensen	-17	16	1.36	+1.19	Alta	11.19	2 Stations		.00	
Vermont	23.8	+5.8	Wildor	57	17	Lebanon	-23	8	3.78	+9.99	Ways Mill	7.36	Enosburg Falls		1.83	
Virginia	41.2	+4.5	Walkerton	76	16	Big Meadows	6	5	3.36	+0.06	Dahlgren Prov. Gds.	6.04	Newport News		.87	
Washington	40.0	+9.2	2 Stations	68	8	Republic	4	6	10.52	+6.15	Aberdeen 2NNE	49.16	Chesaw		1.53	
West Virginia	37.9	+4.8	5 Stations	69	14	2 Stations	3	24	4.54	+8.87	Belva	8.50	Princeton		1.94	
Wisconsin	19.9	+5.6	2 Stations	57	15	Danbury	-36	16	.89	-.35	Brule Ranger Sta.	2.58	Menomonie		.24	
Wyoming	30.7	+12.2	4 Stations	70	9	Rochelle 3E	-21	16	1.03	+1.19	Snake River	8.32	3 Stations		T	
*Alaska	21.5	+9.9	Bell Island	62	8	Allakaket	-43	30	2.91	+8.81	Whittier	40.32	Wainwright		.03	
**Hawaii	69.4	-.4	Puunene CAA AP	89	22	Kole Kole	29	4	4.45	-3.29	Kailua Mauka	22.35	10 Stations		.00	
Puerto Rico	72.9	-.1	Ponce (2)	92	93	Gasquez Dam	49	2	2.10	-1.74	Rio Blanco (1,800 ft.)	8.44	Yauco		.00	

\* Other dates also.

\* November 1952.

\*\* December 1952.



## CLIMATOLOGICAL DATA

Table 2

JANUARY 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation										Wind				No. of days (sunrise to sunset)					
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max 90° F. or above Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days .01 inch or more With thunderstorms	Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunrise		
																			Total	Max. depth on ground													
																																M. p. h.	M. p. h.
Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	%	In.	In.	In.	In.	In.	M.	M.	0-3	4-8	7-10	0-10	%										
ALABAMA																																	
Anniston	599	-----	1017.5	60	36	47.7	+1.9	74	17	23	4	0	14	40	8.85	+3.77	3.98	11	4	T	7.1	SW	*30	NW	2	6	8	17	7.0	--	--		
Birmingham	610	992.6	1018.0	60	39	49.3	+4.1	74	17	23	4	0	8	39	7.82	+2.84	4.27	10	2	T	11.2	S	38	NE	9	7	17	6.9	54	45			
Mobile CO	10	-----	1018.9	64	46	55.1	+2.0	73	20	32	4	0	1	---	5.00	+1.17	2.33	10	1	T	13.3	S	50	SW	20	11	6	14	5.4	--	--		
Mobile	211	1010.8	1018.9	65	44	54.5	+1.8	74	17	31	12	0	2	47	79	3.30	+1.55	1.17	8	2	0.0	12.3	S	---	---	14	6	11	4.6	--	--		
Montgomery CO	201	-----	1018.9	62	43	52.6	+2.3	76	17	29	4	0	1	---	3.39	-1.22	1.08	10	4	T	---	S	---	---	---	---	---	---	---	---	---	---	
Montgomery	198	1010.8	1018.5	62	40	51.0	+1.8	75	17	25	4	0	7	43	3.97	-1.63	1.30	10	5	T	7.9	S	35	W	23	6	11	14	6.3	48	--		
ARIZONA																																	
Flagstaff	6993	789.4	1023.9	49	21	35.1	+9.8	60	9	12	2	0	31	---	.45	-1.24	.34	3	0	4.0	7	---	---	---	---	---	11	13	7	4.9	--	--	
Phoenix CO	1083	-----	1018.0	71	42	56.6	+5.3	83	11	35	1	0	0	---	.22	-.39	.22	2	0	0	5.6	---	---	---	---	---	15	7	9	4.4	--	--	
Phoenix	1114	980.0	1019.7	70	40	54.5	+4.8	80	11	33	2	0	0	37	57	.23	-.37	.23	2	0	0	4.3	E	*29	NW	21	17	7	7	3.5	--	--	
Prescott	5014	850.7	1021.8	59	28	43.7	+8.4	71	11	20	16	0	24	23	51	.13	-.97	.13	2	0	0	9.1	SW	29	SW	13	14	9	8	4.5	79	--	
Tucson	2558	929.9	1019.3	70	38	53.9	+4.2	87	10	29	1	0	9	27	40	.06	-.57	.06	1	0	0	5.4	SE	29	E	24	19	4	8	3.3	90	--	
Winslow	4880	855.7	1021.8	56	24	40.0	+7.3	66	13	16	28	0	29	21	51	T	-.37	T	0	0	0	7.1	SE	*42	N	21	13	6	12	4.9	--	--	
Yuma	203	1014.2	1019.4	76	47	61.5	+8.0	84	24	36	1	0	0	30	37	.01	-.32	.01	1	0	0	8.0	NW	*33	N	21	22	4	5	2.7	89	--	
ARKANSAS																																	
Fort Smith	458	999.0	1016.2	54	32	42.9	+2.9	72	14	15	16	0	22	34	76	2.37	-.52	1.49	4	0	.6	9.6	W	30	NW	15	11	6	14	5.5	47	--	
Little Rock	257	1002.7	1016.0	57	37	46.9	+5.1	73	26	26	16	0	6	38	77	6.11	+9.99	2.07	8	4	T	10.6	NW	36	NW	24	7	6	18	6.9	39	--	
Texarkana	361	1002.7	1016.4	60	38	49.3	+3.4	75	26	28	17	0	8	40	77	5.47	+3.35	2.34	8	3	T	11.6	S	*40	SSW	26	11	7	13	5.6	76	--	
CALIFORNIA																																	
Bakersfield	489	1005.8	1024.3	62	42	51.7	+4.8	75	31	35	17	0	0	46	82	.62	-.40	.37	7	0	0	2.8	ENE	*18	NW	9	5	17	6.1	--	--		
Beaumont CO	2589	-----	1023.2	63	42	52.7	+6.2	74	29	30	1	0	3	---	1.93	-.60	1.18	5	0	0	---	---	---	---	---	---	15	7	9	4.4	--	--	
Bishop	4108	878.8	1021.6	62	25	43.5	+5.6	75	23	20	3	0	30	---	.11	-1.01	.07	3	0	0	---	---	---	---	---	---	9	10	12	6.0	--	--	
Blue Canyon	5280	842.9	1021.7	68	35	41.5	+4.5	83	10	24	15	0	12	---	19.10	+9.93	3.84	13	1	52.6	56	---	---	---	---	---	4	24	8.3	--	--		
Burbank	699	994.2	1020.6	70	45	57.7	+5.1	84	10	35	1	0	0	40	59	.92	-1.43	.43	4	0	0	3.5	NW	*26	NW	21	13	8	10	5.0	--	--	
Eureka CO	43	1018.6	1021.0	56	46	51.0	+3.8	64	8	33	27	0	0	---	12.63	+6.43	3.85	20	2	0	7.8	---	---	---	---	---	8	0	22	9.4	16	--	
Fresno	331	1011.2	1023.2	60	41	50.5	+5.8	73	24	31	27	0	1	46	88	1.49	-.08	.73	7	0	T	5.4	SE	18	SE	6	6	8	17	7.2	59	--	
Los Angeles CO	312	-----	1020.1	70	51	60.6	+5.6	86	23	42	1	0	0	---	1.08	-1.30	.51	4	0	0	6.3	---	---	---	---	---	21	14	8	9	4.5	75	--
Los Angeles	99	1016.6	1020.1	69	49	58.8	+5.6	86	23	42	*1	0	0	44	66	1.13	-.88	.53	4	0	0	5.6	NE	*37	N	21	12	10	9	4.8	--	--	
Mt. Shasta CO	3543	895.7	1022.0	47	31	38.8	+6.0	62	31	16	27	0	21	---	8.38	+3.84	2.28	15	0	9.1	30	---	---	---	---	---	0	4	27	9.3	--	--	
Oakland	13	1022.7	1023.2	60	46	52.6	+5.4	87	9	37	27	0	0	48	68	1.26	-.39	.39	13	0	T	5.2	SSE	*39	WSW	20	4	6	21	7.7	--	--	
Red Bluff	341	1009.5	1022.2	57	44	50.4	+5.3	70	30	33	27	0	0	44	81	3.56	-.77	.95	15	1	T	10.7	NW	48	SE	8	2	4	25	6.6	45	--	
Sacramento	17	1022.0	1023.0	58	44	50.9	+6.6	69	9	35	26	0	0	47	87	2.56	-.10	.61	13	0	0	10.8	SE	47	E	7	4	10	17	7.6	34	--	
Sandberg CO	4517	867.6	1022.1	53	39	45.8	+6.0	64	11	27	1	0	6	29	58	.22	-1.08	.13	4	0	T	22.5	NE	---	---	---	11	10	10	5.3	--	--	
San Diego	19	1016.9	1020.1	70	50	60.0	+5.1	88	10	43	1	0	0	45	64	.58	-1.11	.34	4	0	0	4.8	N	25	S	6	12	12	7	4.6	71	--	
San Francisco CO	52	-----	1020.1	59	49	54.4	+4.3	69	30	42	5	0	0	---	3.26	-.77	.57	14	0	0	7.0	---	---	---	---	---	13	8	5	18	7.1	44	--
San Francisco	1	1022.4	1023.0	59	47	53.1	+5.2	68	10	37	27	0	0	49	85	3.04	-.43	.54	13	0	0	8.5	SE	39	SSW	7	4	6	21	7.7	--	--	
Santa Catalina	1568	963.4	1019.9	64	52	58.2	+5.3	78	28	44	1	0	0	---	.65	-1.33	.34	5	0	0	---	---	---	---	---	---	14	6	11	4.8	--	--	
Santa Maria	231	1013.5	1022.1	67	45	55.8	+5.4	79	31	34	28	0	0	45	72	1.27	-1.44	.60	8	0	0	8.1	E	*38	NNE	27	10	8	13	5.6	--	--	
COLORADO																																	
Alamosa	7534	772.1	1025.0	42	7	24.5	+7.6	55	25	-9	2	0	31	---	.08	-.15	.07	2	0	1.8	1	---	---	---	---	---	20	8	3	3.1	--	--	
Colorado Springs	6175	809.3	1018.1	52	23	37.6	+8.8	67	11	4	15	0	25	13	41	T	-.22	T	0	0	T	12.3	NW	*45	N	14	12	14	5	4.4	--	--	
Denver	5292	834.7	1015.7	53	26	39.6	+10.9	72	9	2	15	0	21	17	42	.39	-.11	.26	3	0	7.4	4	9	9	SW	8	10	10	11	5.5	64	--	
Grand Junction	4849	863.5	1023.9	43	24	33.5	+9.5	54	26	15	16	0	31	24	78	.53	-.07	.22	9	0	4.2	2	5.2	ESE	*27	SE	14	5	12	14	6.5	50	--
Pueblo	4799	855.7	1017.0	56	23	39.6	+10.2	72	11	-2	16	0	24	19	48	.20	-.18	.12	3	0	2.5	2	9.7	NW	45	N	21	14	11	6	4.3	84	--
CONNECTICUT																																	
Bridgeport	7	1015.6	1016.1	42	28	35.0	+5.8	55	24	19	27	0	22	27	76																		



## CLIMATOLOGICAL DATA

Table 2—Continued

JANUARY 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation										Wind				No. of days (sunrise to sunset)						
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max. 80° F. or above Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine			
																		Oil inch or more	With thunderstorms	In	In			Max. depth on ground	Speed							Direction		
																		Oil inch or more	With thunderstorms	In	In			Max. depth on ground	Speed							Direction		
INDIANA	Evansville	1000.3	1016.3	44	31	37.9	+3.2	64	15	21	5	0	16	32	82	3.93	0.00	0.92	13	2	3.5	2	12.1	NW	34	SE	23	3	3	25	8.0	26		
	Fort Wayne	801	982.4	1014.4	37	24	30.2	+3.9	60	15	-2	6	0	26	26	86	2.23	-.29	.80	14	0	7.5	3	9.0	SW	35	N	11	1	4	26	9.5	22	
	Indianapolis	796	985.1	1015.2	40	26	32.9	+4.1	63	15	7	6	0	26	29	83	2.57	-.58	.63	13	0	4.5	2	13.0	NW	37	W	15	0	6	25	8.6	25	
	South Bend	768	985.8	1014.8	35	23	28.9	+4.3	59	15	1	6	0	28	25	84	2.39	+.39	.61	18	0	11.4	4	12.4	S	36	NW	11	1	5	25	8.8	-	
	Terre Haute	585	993.9	1015.5	41	27	33.9	+4.6	62	15	9	5	0	24	29	84	2.53	+.47	.73	12	0	2.6	2	10.9	S	42	NW	5	0	8	23	8.8	24	
IOWA	Burlington <td>605</td> <td>989.5</td> <td>1016.1</td> <td>35</td> <td>20</td> <td>27.3</td> <td>+3.3</td> <td>59</td> <td>15</td> <td>1</td> <td>6</td> <td>0</td> <td>28</td> <td>22</td> <td>84</td> <td>1.28</td> <td>-.46</td> <td>.52</td> <td>7</td> <td>0</td> <td>11.1</td> <td>5</td> <td>11.0</td> <td>WNW</td> <td>41</td> <td>NW</td> <td>10</td> <td>4</td> <td>0</td> <td>27</td> <td>8.6</td> <td>36</td>	605	989.5	1016.1	35	20	27.3	+3.3	59	15	1	6	0	28	22	84	1.28	-.46	.52	7	0	11.1	5	11.0	WNW	41	NW	10	4	0	27	8.6	36	
	Charles City CO	1013	978.0	-----	28	12	20.2	+3.3	41	15	-12	16	0	31	---	---	1.02	6	1	5.9	8	6.3	---	19	NW	10	4	6	21	7.4	32	---		
	Davenport CO	579	-----	-----	34	19	26.3	+2.0	56	15	3	5	0	28	---	---	1.32	-.25	.46	8	---	13.4	5	---	---	---	---	---	---	---	---	---	---	
	Des Moines	800	984.4	1016.9	32	16	24.1	+2.0	50	15	-8	16	0	30	19	85	.76	-.47	.27	5	1	7.3	5	11.1	NW	66	NW	15	3	6	22	8.0	36	
	Dubuque	641	974.6	1015.3	30	15	22.4	+3.0	56	15	-7	6	0	30	19	87	.91	-.46	.33	9	1	6.5	4	---	29	SSW	12	3	5	23	8.3	---		
	Sioux City	1097	973.9	1017.4	29	9	19.1	-.0	41	10	-23	16	0	31	15	83	1.19	+.45	.44	10	1	12.6	13	8.5	NW	38	NW	15	6	10	15	7.0	54	
KANSAS	Concordia CO <td>1375</td> <td>965.1</td> <td>-----</td> <td>41</td> <td>23</td> <td>31.9</td> <td>+3.8</td> <td>64</td> <td>26</td> <td>-3</td> <td>16</td> <td>0</td> <td>29</td> <td>---</td> <td>---</td> <td>.08</td> <td>-.51</td> <td>.06</td> <td>2</td> <td>0</td> <td>.8</td> <td>3</td> <td>7.1</td> <td>---</td> <td>32</td> <td>NW</td> <td>15</td> <td>10</td> <td>8</td> <td>13</td> <td>5.5</td> <td>61</td>	1375	965.1	-----	41	23	31.9	+3.8	64	26	-3	16	0	29	---	---	.08	-.51	.06	2	0	.8	3	7.1	---	32	NW	15	10	8	13	5.5	61	
	Dodge City	2594	926.2	1015.9	52	26	39.1	+8.8	72	12	6	16	0	24	24	66	.15	-.34	.09	2	0	1.2	4	15.7	NW	49	N	15	14	9	8	4.6	72	
	Goodland	3645	886.6	1015.9	52	22	36.5	+10.7	75	12	-3	16	0	30	23	65	.04	-.27	.02	2	0	.4	1	13.8	WSW	49	NW	21	10	7	14	5.6	---	
	Topeka	926	979.7	1016.7	44	24	33.8	+5.1	64	12	0	16	0	30	25	79	.10	-.87	.08	2	0	.9	2	9.3	W	38	N	15	5	10	16	6.7	48	
	Wichita	1372	966.1	1015.8	48	27	37.4	+5.4	69	26	3	16	0	24	27	75	.15	-.90	.12	3	0	1.7	2	13.7	NW	35	NW	15	9	13	9	5.3	71	
KENTUCKY	Lexington <td>979</td> <td>979.0</td> <td>1015.5</td> <td>48</td> <td>32</td> <td>39.7</td> <td>+7.2</td> <td>65</td> <td>15</td> <td>14</td> <td>6</td> <td>0</td> <td>16</td> <td>32</td> <td>78</td> <td>4.10</td> <td>-.40</td> <td>1.28</td> <td>17</td> <td>1</td> <td>5.1</td> <td>3</td> <td>15.4</td> <td>SE</td> <td>---</td> <td>---</td> <td>---</td> <td>2</td> <td>4</td> <td>25</td> <td>8.7</td> <td>---</td>	979	979.0	1015.5	48	32	39.7	+7.2	65	15	14	6	0	16	32	78	4.10	-.40	1.28	17	1	5.1	3	15.4	SE	---	---	---	2	4	25	8.7	---	
	Louisville CO	457	-----	-----	47	34	40.4	+4.8	66	15	22	6	0	14	---	---	3.65	-.42	.86	9	1	4.8	3	---	---	---	---	---	---	---	---	---	---	
	Louisville	485	998.6	1015.0	47	33	40.0	+5.1	65	15	21	6	0	17	32	78	3.68	-.42	.79	14	1	4.8	3	10.2	S	42	S	15	1	6	24	8.7	20	
LOUISIANA	Baton Rouge <td>64</td> <td>1015.2</td> <td>1018.2</td> <td>68</td> <td>44</td> <td>55.7</td> <td>+3.3</td> <td>78</td> <td>16</td> <td>31</td> <td>4</td> <td>0</td> <td>2</td> <td>45</td> <td>75</td> <td>.99</td> <td>-2.50</td> <td>1.75</td> <td>6</td> <td>3</td> <td>.0</td> <td>0</td> <td>10.4</td> <td>SE</td> <td>---</td> <td>---</td> <td>---</td> <td>13</td> <td>10</td> <td>8</td> <td>4.5</td> <td>---</td>	64	1015.2	1018.2	68	44	55.7	+3.3	78	16	31	4	0	2	45	75	.99	-2.50	1.75	6	3	.0	0	10.4	SE	---	---	---	13	10	8	4.5	---	
	Lake Charles	12	1016.6	1018.0	67	45	55.9	+3.3	76	31	32	18	0	1	47	80	1.95	-2.87	1.25	5	2	.0	0	13.3	SE	42	S	22	12	10	9	4.7	---	
	New Orleans CO	32	1016.3	-----	67	50	58.3	+2.4	77	20	40	4	0	6	7	80	2.06	-2.72	.96	10	4	.0	0	7.3	---	38	S	23	16	4	13	4.9	62	
	New Orleans	12	1016.3	1018.2	67	46	56.8	+1.9	78	20	32	4	0	1	48	79	2.56	-2.12	1.18	9	2	.0	0	11.8	SSW	45	SSW	23	14	7	10	4.5	---	
	Shreveport	174	1007.1	1016.6	63	40	51.4	+3.6	75	7	30	18	0	4	42	76	4.26	-4.62	2.32	8	5	T	0	12.2	S	---	---	---	11	6	14	5.5	64	
MAINE	Caribou <td>824</td> <td>990.5</td> <td>1015.1</td> <td>25</td> <td>6</td> <td>15.8</td> <td>+7.1</td> <td>45</td> <td>25</td> <td>-15</td> <td>1</td> <td>0</td> <td>31</td> <td>9</td> <td>75</td> <td>3.02</td> <td>+.78</td> <td>.81</td> <td>14</td> <td>0</td> <td>19.1</td> <td>11</td> <td>9.8</td> <td>WSW</td> <td>60</td> <td>WSW</td> <td>16</td> <td>4</td> <td>7</td> <td>20</td> <td>7.5</td> <td>---</td>	824	990.5	1015.1	25	6	15.8	+7.1	45	25	-15	1	0	31	9	75	3.02	+.78	.81	14	0	19.1	11	9.8	WSW	60	WSW	16	4	7	20	7.5	---	
	Eastport CO	33	1019.0	1021.0	36	21	28.6	+6.6	51	24	7	27	0	29	---	---	4.30	+1.14	1.39	13	0	13.5	4	11.8	---	47	SW	25	9	7	15	6.8	37	
	Portland	61	1010.8	1014.8	37	20	28.5	+7.8	53	16	5	27	0	30	22	80	5.15	+.72	1.21	14	0	13.5	7	9.9	N	40	SE	28	4	11	16	7.2	53	
MARYLAND	Baltimore CO <td>14</td> <td>-----</td> <td>-----</td> <td>48</td> <td>35</td> <td>41.7</td> <td>+5.1</td> <td>70</td> <td>16</td> <td>28</td> <td>17</td> <td>0</td> <td>10</td> <td>---</td> <td>---</td> <td>4.78</td> <td>+1.12</td> <td>1.91</td> <td>13</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td>	14	-----	-----	48	35	41.7	+5.1	70	16	28	17	0	10	---	---	4.78	+1.12	1.91	13	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Baltimore	146	1011.2	1016.3	47	31	39.2	+4.6	71	16	22	5	0	17	30	74	4.56	+.90	1.67	14	0	2.4	1	11.0	W	50	W	25	3	11	17	7.2	37	
	Frederick	294	-----	-----	45	27	36.1	+3.4	66	24	19	31	0	29	---	---	3.59	+.71	.81	15	0	3.0	3	---	---	---	---	---	---	---	---	---	---	
MASSACHUSETTS	Blue Hill Obs. <td>640</td> <td>991.0</td> <td>-----</td> <td>39</td> <td>25</td> <td>31.9</td> <td>+6.0</td> <td>55</td> <td>24</td> <td>10</td> <td>17</td> <td>0</td> <td>27</td> <td>---</td> <td>---</td> <td>7.05</td> <td>+2.97</td> <td>2.61</td> <td>15</td> <td>0</td> <td>23.0</td> <td>9</td> <td>17.2</td> <td>W</td> <td>47</td> <td>SE</td> <td>24</td> <td>6</td> <td>10</td> <td>15</td> <td>8.8</td> <td>40</td>	640	991.0	-----	39	25	31.9	+6.0	55	24	10	17	0	27	---	---	7.05	+2.97	2.61	15	0	23.0	9	17.2	W	47	SE	24	6	10	15	8.8	40	
	Boston	12	1010.5	1015.1	41	28	34.7	+5.6	58	24	10	17	0	24	25	69	6.28	+2.78	1.96	15	0	13.6	10	13.7	NW	47	S	24	5	7	19	7.1	48	
	Mantucket	43	1014.9	1015.3	42	30	36.4	+4.3	51	24	20	27	0	21	32	83	8.24	+.43	2.82	14	1	1.2	1	13.5	WNW	45	N	22	5	5	21	7.8	36	
	Pittsfield	1153	971.6	1015.2	36	20	27.8	+6.0	54	4	27	0	30	---	---	---	4.77	+1.67	1.74	16	0	19.2	11	---	---	---	---	---	---	5	9	17	7.2	---
MICHIGAN	Alpena CO <td>587</td> <td>990.9</td> <td>-----</td> <td>32</td> <td>19</td> <td>25.4</td> <td>+4.2</td> <td>49</td> <td>15</td> <td>-1</td> <td>26</td> <td>0</td> <td>30</td> <td>---</td> <td>---</td> <td>1.44</td> <td>-.22</td> <td>.50</td> <td>17</td> <td>0</td> <td>14.2</td> <td>8</td> <td>10.5</td> <td>---</td> <td>35</td> <td>NW</td> <td>16</td> <td>0</td> <td>7</td> <td>24</td> <td>8.9</td> <td>18</td>	587	990.9	-----	32	19	25.4	+4.2	49	15	-1	26	0	30	---	---	1.44	-.22	.50	17	0	14.2	8	10.5	---	35	NW	16	0	7	24	8.9	18	
	Detroit	619	987.1	1014.5	36	25	30.6	+4.4	57	15	11	7	0	27	25	82	1.90	-.18	.53	17	0	9.4	2	10.6	NW	44	W	16	2	3	26	8.7	16	
	Escanaba CO	584	991.5	-----	29	16	22.8	+5.3	35	1	-2	31	0	31	---	---	.96	-.57	.45	10	1	4.9	2	10.2	---	---	---	---	---	---	---	---	---	
	Grand Rapids	938	988.5	1014.5	34	21	27.4	+3.9	56	15	-1	7	0	30	24	86	1.62	-.28	.41	16	0	11.0	3	10.5	ESE	42	W	15	3	1	27	8.1	27	
	Lansing	859	981.7	1014.8	33	21	26.8	+3.0	56	15	3	7	0	30	23	85	2.02	+.15	.78	15	0	7.9	3	13.4	NE	45	W	31	2	26	8.7	13	---	
	Marquette CO	677	986.1	-----	28	17	22.2	+3.5	36	10	-1	31	0	31	---	---	2.21	+.04	.78	18	0	17.8	17	8.8	---	33	SW	12	0	5	26	9.3	16	
	Muskegon	627	990.5	1014.6	33	22	27.5	+2.6	54	15	6	7	0	30	23	82	1.20	-.75	.30	13	1	11.1	2	9.5	E	37	W	15	2	1	28	9.0	---	
	Sault Ste. Marie	721	990.9	1014.5	26	12	18.9	+5.1	41	15	-7	26	0	31	15	83	3.21	+1.05	.64	16	1	32.1	23	8.4	E	34	W	31	3	4	24	8.5	24	
	Ypsilanti	722	985.1	1014.2	36	23	29.6	+4.3	59	15	8	7	0	29	25	84	1.80	.00	.58	16	0	10.5	3	10.8	SW	30	WSW	16	1	4	26	8.8	---	
MINNESOTA	Duluth <td>1128</td> <td>972.2</td> <td>1015.6</td> <td>21</td> <td>2</td> <td>11.4</td> <td>+3.6</td> <td>37</td> <td>10</td> <td>-23</td> <td>16</td> <td>0</td> <td>31</td> <td>6</td> <td>79</td> <td>1.24</td> <td>+.01</td> <td>.44</td> <td>13</td> <td>0</td> <td>19.8</td> <td>18</td> <td>11.1</td> <td>NNW</td> <td>40</td> <td>NW</td> <td>15</td> <td>3</td> <td>10</td> <td>18</td> <td>7.6</td> <td>41</td>	1128	972.2	1015.6	21	2	11.4	+3.6	37	10	-23	16	0	31	6	79	1.24	+.01	.44	13	0	19.8	18	11.1	NNW	40	NW	15	3	10	18	7.6	41	
	Intern'l Falls	1179	970.9	1016.7	16	-8	4.2	+1.2	32	9	-38	16	0	31	1	78	1.70	+.81	.74	17	0	17.5	17	9.0	---	---	---	---	4	7	20	7.8	---	
	Minneapolis	830	982.1	1017.4	24	9	16.7	+2.1	40	10	-15	16	0	31	12	82	.55	-.25	.32	8	0	6.0	7	10.1	NW	34	NW	10	5	3	23	7.7	24	
	Rochester	1014	978.0	1016.7	26	8	17.3	+3.0	38	12	-18	6	0	31	13	83	1.23	+.30	.77	8	1	6.9	8	9.5	NW	---	---	---	4	7	20	7.9	---	
	St. Cloud	1034	976.6	1016.6	22	4	13.2	+2.7	40	10	-23	16	0	31	9	82	.92	+.17	.60	9	0	9.7	5	7.6	NW	---	---	---	7	4	20	7.5	---	
	St. Paul	703	984.4	1016.6	25	10	17.5	+2.6	41	10	-14	16	0	31	13	82	.58	-.29	.39	6	0	4.4	5	10.7										

See footnotes at end of table.



## CLIMATOLOGICAL DATA

JANUARY 1953

Table 2-Continued

[illegible]

See footnotes at end of table.



## CLIMATOLOGICAL DATA

Table 2—Continued

JANUARY 1953

State and station	Elevation (ground)	Pressure			Temperature										Precipitation										Wind			No. of days																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal			Highest	Date	Lowest	Date	No. of days		Average relative humidity		Total	Departure from normal		Greatest in 24 hours		No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile			No. of days																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
							Max. 90° F. or above	Min. 32° F. or below	°F.					°F.	°F.	°F.	°F.		°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.			°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F



## CLIMATOLOGICAL DATA

Table 2—Continued

JANUARY 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation						Wind				No. of days (sunrise to sunset)		Possible sunshine																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
		Station	Sea level	Average maximum		Average minimum		Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed		Prevailing direction	Fastest mile	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
				°F	°F	°F	°F							°F	°F						°F	°F	°F	°F										°F	°F	°F	%	in.	in.	in.	in.	in.	in.	Max. depth on ground	M. p. h.	M. p. h.	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
																																																					°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F

Data from airport unless otherwise specified. CO indicates data from city office.

\* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

° Other dates also.

† Peak gust.

# Max. 70° F. or above for Alaskan stations.

# HEATING DEGREE DAYS

(Base 65°F.)

JANUARY 1953

Table 3

State and station	Current season			State and station	Current season			State and station	Current season			State and station	Current season		
	This month	Period July through this month	Long term mean July through this month		This month	Period July through this month	Long term mean July through this month		This month	Period July through this month	Long term mean July through this month		This month	Period July through this month	Long term mean July through this month
ALABAMA				IOWA				NEW MEXICO				TEXAS (Cont'd.)			
Birmingham	478	1752	1592	Burlington	1162	3471	3491	Albuquerque	700	2552	2748	Del Rio	261	929	1062
Mobile (CO)	307	1066	1000	Charles City (CO)	1382	4270	4479	Clayton	716	2881	2914	El Paso	450	1598	1690
Mobile	318	1092		Davenport (CO)	1193	3420	3642	Raton	883	3588		Fl. Worth	404	1415	1495
Montgomery (CO)	380	1312	1319	Des Moines	1260	3776	3775	Roswell	538	2141	2283	Galveston (CO)	210	699	766
Montgomery	427	1471	1332	Dubuque	1311	4102	4049					Galveston	224	721	
ARIZONA				Keokuk (CO)	1067	3108		NEW YORK				Houston (CO)	233	829	
Flagstaff	922	3865	4031	Sioux City	1413	4169	4098	Albany	1101	3628	3734	Houston	263	906	880
Phoenix (CO)	259	873	963	KANSAS				Bear Mountain (CO)	1052	3429		Laredo	124	540	
Phoenix	318	999		Concordia (CO)	1017	3240	3207	Binghamton	1132	3831	3787	Lubbock	562	2160	
Prescott	655	2323		Dodge City	797	2919	3021	Buffalo	1038	3374	3689	Palestine (CO)	390	1302	1340
Tucson	339	1070		Goodland	876	3535	3340	New York (CO)	832	2493	2889	Port Arthur (CO)	239	872	891
Winslow	768	2772		Topeka (CO)	954	2972	3059	La Guardia Field	829	2401		Port Arthur	278	996	
Yuma	119	581	747	Topeka	959	3103		Oswego (CO)	1053	3320	3791	San Angelo	344	1333	
ARKANSAS				Wichita	846	2764	2800	Rochester	1058	3361	3655	San Antonio	278	1000	960
Ft. Smith	677	2205	2023	KENTUCKY				Schenectady	1062	3470		Victoria	210	774	
Little Rock	555	1914	1894	Lexington	777	2633	2780	Syracuse	1064	3389	3768	Waco	345	1297	
Texarkana	480	1672		Louisville (CO)	756	2396	2599					Wichita Falls	507	1735	
CALIFORNIA				Louisville	764	2535		NORTH CAROLINA							
Bakersfield	406	1226	1435	Pikeville (CO)	652	2194		Asheville (CO)	701	2451	2391	UTAH			
Beaumont (CO)	374	1408		LOUISIANA				Asheville	728	2673		Milford	842	3259	
Bishop	661	2382	2658	Baton Rouge	293	1069	989	Charlotte	560	1928	1987	Salt Lake City (CO)	731	2703	3274
Blue Canyon	719	2615		Lake Charles	279	986		Greensboro	653	2267	2315	Salt Lake City	784	2980	3542
Burbank	222	882		New Orleans (CO)	209	729	810	Hatteras	419	1292	1374	VERMONT			
Eureka (CO)	425	2561	2641	New Orleans	249	818		Raleigh (CO)	521	1824	1972	Burlington	1241	3926	4371
Fresno	441	1395	1536	Int. Airport, Moisant	252	921		Raleigh	561	2005		VIRGINIA			
Los Angeles (CO)	157	652	736	Shreveport	416	1461	1387	Wilmington	421	1442	1439	Cape Henry (CO)	568	1765	1906
Los Angeles	199	813		MAINE				Winston-Salem	622	2104		Lynchburg	727	2412	2388
Mt. Shasta (CO)	808	2930		Caribou	1520	5194		NORTH DAKOTA				Norfolk (CO)	535	1673	1910
Oakland	376	1468	1734	Eastport (CO)	1124	3883	4467	Bismarck	1519	4761	5235	Norfolk	580	1992	
Red Bluff	447	1450	1647	Greenville (CO)	1466	4874	5241	Devils Lake (CO)	1721	5285	5971	Norfolk	654	2124	2271
Sacramento (CO)	404	1348	1610	Portland	1124	3789	4009	Fargo	1690	5068	5443	Richmond (CO)	680	2268	
Sacramento	431	1479		MARYLAND				Grand Forks	1759	5309	5765	Richmond	680	2268	
Sandberg (CO)	590	2096		Baltimore (CO)	714	2190	2530	Pembina	1789	5224		Rosamoke	719	2391	2446
San Diego	156	609	822	Baltimore	793	2573		Williston (CO)	1511	4685	5399	WASHINGTON			
San Francisco (CO)	324	1740	1789	Frederick	888	2971		OHIO				Ellensburg	931	3528	
San Francisco	361	1693	1886	MASSACHUSETTS				Akron	1014	3406	3485	Kelso	573	2641	
San Jose	349	1198		Boston	930	2858	3221	Cincinnati	795	2495	2846	North Head (CO)	551	2689	2842
Santa Catalina	234	1054		Milton	1027	3285		Cincinnati	877	2872		Olympia	641	2892	
Santa Maria	279	1516		Nantucket	878	2779	2920	Cleveland (CO)	919	2871	3340	Port Angeles	640	3107	
COLORADO				Pittsfield	1145	3945		Cleveland	969	3095		Seattle (CO)	545	2123	2543
Alamosa	1247	5108		MICHIGAN				Columbus	915	3050	3134	Seattle	636	2743	
Colorado Springs	844	3459		Alpena (CO)	1219	3952	4388	Dayton	961	3112	3169	Spokane	832	3349	3790
Denver	781	3197	3289	Detroit	1062	3304	3659	Sandusky (CO)	962	2980	3357	Tacoma (CO)	566	2429	2830
Grand Junction	970	3224	3515	Escanaba (CO)	1303	4291	4706	Toledo	1036	3324	3513	Tatoosh Island (CO)	603	3079	3283
Pueblo	780	3150	3277	Grand Rapids (CO)	1115	3459	3726	OKLAHOMA				Walla Walla (CO)	508	2396	2990
CONNECTICUT				Grand Rapids	1157	3721		OKLAHOMA City (CO)	672	2155	2254	Yakima	805	3192	3538
Bridgeport	922	2815		Lansing	1179	3757	3967	OKLAHOMA City	681	2176		WEST VIRGINIA			
Hartford	1009	3147	3382	Marquette (CO)	1318	4308	4709	Tulsa	732	2270		Charleston	705	2481	
New Haven	952	2955	3227	Muskegon	1155	3697		Baker (CO)	837	3500	4150	Elkins	884	3270	3300
DELAWARE				Sault Ste. Marie	1424	4605	5010	Baker	883	3965		Huntington (CO)	706	2269	
Wilmington	846	2700		Ypsilanti	1089	3405		Burns (CO)	907	3577		Parkersburg (CO)	778	2638	2862
DIST. OF COLUMBIA				MINNESOTA				Eugene	556	2480		Petersburg	805	2740	
Washington (CO)	724	2294	2609	Duluth (CO)	1622	5186	5379	Meacham	870	3638		WISCONSIN			
Washington	747	2372		Duluth	1654	5271		Medford	702	2521	2768	Green Bay	1369	4415	4439
FLORIDA				International Falls	1886	5853		Pendleton	589	2701		La Crosse	1384	4174	
Apalachicola (CO)	275	820	778	Minneapolis	1488	4444	4633	Portland (CO)	505	2007	2497	Madison (CO)	1280	3882	4213
Daytona Beach	223	587		Rochester	1477	4635		Portland	539	2278		Madison	1300	4033	
Fort Myers	98	245	187	St. Cloud	1601	4915	5107	Roseburg	554	2305	2465	Milwaukee (CO)	1173	3551	3933
Jacksonville (CO)	227	685	731	St. Paul	1465	4394	4634	Salem	553	2459		Milwaukee	1216	3743	
Jacksonville	264	807		MISSISSIPPI				Sexton Summit (CO)	790	2855		WYOMING			
Key West (CO)	14	36	30	Jackson	394	1464	1398	Troutdale	527	2189		Casper	992	3882	
Key West	23	51		Meridian	415	1563	1418	PENNSYLVANIA				Cheyenne	907	3814	4163
Melbourne	159	385		Vicksburg (CO)	362	1344	1318	Allentown	971	3115		Lander	1021	4064	4791
Miami (CO)	61	130	104	MISSOURI				Erie (CO)	922	2961	3357	Rock Springs (CO)	990	4139	
Int. Airport, Hialeah	45	102		Columbia	943	2930	3004	Harrisburg	889	2860	3073	Rock Springs	1078	4310	
Miami Beach	42	84		Kansas City	937	2829	2969	Philadelphia (CO)	1096	3633	2663	Sheridan	962	3754	
Orlando	184	461		St. Joseph	1048	3247	3211	Philadelphia	833	2559		ALASKA			
Pensacola (CO)	277	905	912	St. Louis (CO)	890	2575	2721	Philadelphia	833	2559		December 1952			
Tallahassee	306	947		St. Louis	914	2747	2720	Pittsburgh (CO)	806	2642	3011	Anchorage	1460	4386	
Tampa	153	423	356	Springfield	841	2771		Pittsburgh	885	2995	3253	Annette Island	784	2762	
West Palm Beach	79	171		MONTANA				Reading (CO)	857	2676	2957	Barrow	2341	8246	8383
GEORGIA				Billings	886	3392		Scranton (CO)	972	3151	3466	Bethel	1944	5383	5658
Albany	352	1190	1063	Butte	1093	5167		Williamsport	967	3237	3443	Cordova	1029	3866	
Athens	557	1817		Glasgow (CO)	1472	4678		RHODE ISLAND				Fairbanks	2119	5821	6460
Atlanta	523	1758	1829	Great Falls	1005	3646		Block Island	876	2684	2921	Galena	2128	5993	
Atlanta	548	1864		Havre (CO)	1273	4360	4892	Providence	901	2795	3216	Gambell	1687	5785	
Augusta	457	1580	1437	Helena	937	4245	4539	Providence	937	2984		Junesau	975	3481	
Columbus	470	1581		Kelispell	937	4143	4678	SOUTH CAROLINA				Kotzebue	1893	5961	
Macon	435	1437	1467	Miles City	1160	4030		Charleston (CO)	350	1100	1129	McGrath	2178	5969	
Rome	594	2103		Missoula	897	3967									



## SEVERE STORMS

Table 4

JANUARY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Pennsylvania, central portion	Dec. 31-Jan. 1				4	50			Snow	Slippery highways resulted in numerous traffic accidents. 33 persons injured in a truck-bus crash south of York. At least 17 others injured in other highway accidents. Property damage of \$1,600 reported from a 3-car accident.
Philadelphia area, Pa.	Dec. 31-Jan. 1				1	5			Snow, sleet, and ice (glaze)	Icy highways, from packed snow and glaze, slowed and in some cases stalled traffic. Deaths and injuries resulted from highway accidents. Ice-coated wires fell, depriving 150 homes of power for short interval.
West Virginia, entire State	6-7								Snow	Snowfall, ranging from 2 inches at Parkersburg and 5 inches at Wheeling to 8 inches at Alpena (Randolph County) and 11 inches at Thomas, high in mountains of Tucker County, slowed automobile traffic until melted by rains of 7th and 8th. Melting snow and rains caused small streams to overflow roads in a few places.
Orleans Parish, La.	7	10 a.m.			3		Minor		Thunder-squall	3 men drowned in Lake Pontchartrain when small boat capsized during thundersquall.
Macedonia area, Lee Township, Cleveland County, Ark.	7	8:15 p.m.	100	4	0	2	\$2,950	\$ 0	Tornado, hail, and rain	Storm traveled east-northeastward, skipping frequently over path about 4 miles in length. Several houses damaged, 2 extensively. 2 barns damaged, and several small outbuildings destroyed. Some damage to timber. Trees and debris lay crosswise of path and in all directions. Hail very light and small.
Idaho, northern and western portions	7, 8, 9								Winds	Power and communication lines down, disrupting service for several hours at a time. Localities affected included Mesa, Nezperce, Wallace, and Sandpoint.
Oregon, most of State	7-9		State-wide	State-wide	1		1,000,000	4,000 including livestock	Wind and rain	Widespread damage to power and telephone lines, outdoor signs, metal awnings, theatre marquees, and dock installations along Columbia and Willamette Rivers and the coast. Blown-down power lines caused a number of small fires and, in Enterprise area, electrocuted five head of fairly valuable cattle. Several buildings either blown down or damaged by roofs being blown off, plate-glass windows being smashed, or other structural damage. Death occurred near Estacada when man struck by a tree felled by wind. Gusts recorded of 75 to 100 m.p.h. along coast and 40 to 65 m.p.h. inland. Several small boats damaged and shipping was prevented from coming up Columbia River for 2 to 3 days. Major flooding ensued along many coastal streams and to minor extent in Willamette Valley. A considerable number of logs impounded in coastal streams were scattered by this flooding, but damage from flooding was not great.
Pennsylvania, central and eastern portions	7-11					11			Snow, sleet, ice (glaze), and wind	A widespread storm area resulted in icy highways, downed power and telephone lines, damaged forests, and much other property damage from weight of glaze coating. Damage and glaze thickness heaviest in about an 80-mile wide band from Somerset and Cambria Counties to Northampton and Wayne Counties. Intermittent periods of freezing rain over 5-day period totalled over 40 hours at 2 stations where hourly records were available and probably totalled twice that and more on ridges and higher terrain. In most areas, glaze formed at all elevations above 400 feet, m.s.l., but did not persist long enough to cause damage, except above 1,200 feet. Rate of accumulation was slow enough so that no major damage to utility lines, trees, or property resulted, except in spotty areas where strong winds developed. Some of heaviest damage from ice and wind occurred in Schuylkill-Monroe County area where thickness on wires reached 4 to 4-3/8 inches, and circumference reached 10 to 13 inches. Steel towers supporting high-voltage lines downed in this area, with power and telephone service out for periods up to 5 days. The Pennsylvania Power and Light Company reported 50,000 customers without service at some time during period, and that they had 125 line crews at work restoring service. Mountain area between Franklin, Centre, and Somerset Counties also heavily glazed. Near McConnellsburg (2 days after storm) a 15-inch length of coated wire weighed 2 lbs. Franklin County residents reported ice heaviest in 25 years. The heaviest coating reported was just south of Pennsylvania-Maryland line in Garrett County, Md., where ice weighed 4 lbs. per foot of

## SEVERE STORMS

Table 4—Continued

JANUARY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Pennsylvania, central and eastern portions (Cont'd.)	7-11									line. The Metropolitan Edison Company reported power-line damage of \$22,500 in Reading area alone. Forest damage near Cresson estimated at \$10,000, and near Beavertown at \$8,000. Ice-loading damaged a radio tower near Williamsport to extent of \$2,500. Some schools closed on 8th. Scores of minor traffic accidents occurred, with at least 11 persons suffering injuries. Ice-coated hills slowed or stalled traffic, especially on 7th and 8th.
Red Boiling Springs (4 miles north-northwest of), Macon County, Tenn.	8	2:05 a.m.	60	2-3/4			\$1,400		Wind	Storm described as "one big puff" at the home it first struck, causing \$500 damage. Damage estimated at \$900 at another home. It lasted 2 minutes before passing on in an east-northeastward direction. Only little evidence of twisting force.
Dallas County, Ala.	8	6:30 a.m.	165	1/2	0	0	6,000		Tornado	Occurred in Valley Creek community 12 miles north of Selma. 1 residence demolished and contents destroyed; 1 garage collapsed on automobile. 1 residence and 1 outbuilding damaged.
Talladega County, Ala.	8	7:10 a.m.	800	4	0	0	5,000		do	Storm occurred in vicinity of West Talladega. Roofs on 20 buildings damaged. Trees blown down on telephone and power lines.
Garrett and Allegany Counties, Md.	8, 9, 10	A.m.-p.m.					100,000		Ice and snow	3 days of sleet, snow, and freezing rain caused power and telephone damage estimated at \$100,000. Oakland, Friendsville, and Accident hardest hit; communications disrupted. Highway 40 covered with 2 to 3 inches of ice. Wires snapped due to weight of ice; crosswires and telephone poles down. Considerable damage sustained by trees.
New England, southern and central portions	8-11				31		2,500,000		Snow, sleet, ice (freezing rain) and rain	Snow beginning early on 8th over Rhode Island and Connecticut overspread central New England during day, accumulating from about 5 to more than 20 inches before changing to sleet, freezing rain, and rain on 9th. Thereafter precipitation occurred in form of rain or freezing rain until afternoon or evening of 11th. Most severe damage from glaze which snapped trees and wires, cutting off electric power and telephone service to many thousands of users, tied up transportation, and caused many automobile accidents. Connecticut hardest hit. State of emergency declared at Norwalk, Conn., because of many high tension wires sputtering in streets, and 90 percent of city without electric power and telephone service. Fatalities due mainly to overexertion; number of injuries considerable.
Washington, western portion	8						25,000		Wind	High wind speeds from 70 to 95 m.p.h. reported from Seattle southwest to Hoquiam. Smokestack wrecked in Seattle; power and communication lines damaged over large area in southwestern Washington. Forest and shade trees damaged in some areas.
Washington, eastern portion	8-9						70,000		do	High winds destroyed roof on large warehouse at Pasco, and caused minor damage in other sections of southeastern Washington.
Effingham, Florence County, S. C.	8	5:15 p.m.	50 to 150	8	0	2	60,000		Tornado	Moved northeastward from point of origin about 3 miles south of Effingham for about 8 miles to a point just southwest of Claussen. 1 home and 13 outbuildings destroyed and 27 homes and 44 outbuildings damaged. About 40 families affected.
Lincoln County, Miss.	8	7-7:30 p.m.		1			50,000	Slight	Thunder-squall	In northern portion of Brookhaven, large number of buildings unroofed.
Winston County, Miss.	8	8:30-9 p.m.					20,000		do	2 buildings destroyed, several damaged.
Kemper County, Miss.	8	9-9:30 p.m.					15,000		do	1 building destroyed, several damaged.
Garneil, Mont.	8-9				1	2	10,000		Wind	Windstorm covered most of central Montana late evening of 8th and on 9th reached speeds of 70 m.p.h. and gusts of 85 m.p.h. in a few areas. It blew stock cars off of siding at Garneil and along track, causing train wreck at Sipple. Engineer killed and 2 crewmen injured. Property listed was from this train wreck. Minor damage reported in several areas.
Brooksville, Fla.	9	3:30-4 a.m.			0	0		\$ 0	Tornado	Tornado passed 4½ miles west of Brooksville moving northwestward. Large part of roof removed from home; smaller buildings wrecked; some trees snapped off and others uprooted.



## SEVERE STORMS

Table 4—Continued

JANUARY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Sarasota, Fla.	9	6:30 a.m.	1,700				\$300,000	Light	Wind	Some reports called this storm a tornado, but from examination of affected area several hours later, storm appeared to have been a straight blow from southwest in connection with severe line-squall thunderstorms. Store windows blown out; trees, electric and telephone lines damaged; several house trailers blown over. Several automobiles damaged by falling trees.
Hillsborough County, Fla.	9	Morning	100	10	0	12		Light	Tornado	Storm moved northeastward; destroyed 5 homes and damaged 53 others. Storm path in southwestern Hillsborough County.
Captiva Island, Fla.	9	Morning							Storm wave	Storm waves reached southern half of Captiva Island and washed over road. Wind speed estimated at 50 m.p.h. at 9:30 a.m.
Clermont and Minneola, Fla.	9	Morning			0	0		\$ 0	Tornado	Small tornado uprooted trees and caused minor damage to a few houses.
Fort Myers, Fla.	9	10:30-11 a.m.					500		Wind and hail	Hail light and caused no damage. Wind reached 52 m.p.h. in gusts. Trees and sign boards blown down; radio and TV aerials damaged; some damage to boats.
Wilsal, Mont.	9	11 a.m.					900	400	Wind	
New Jersey, northern third	9-10	P.m., 9th- a.m., 10th			7	Many	1,000,000	500,000	Ice (glaze) and wind	Icy roads caused 6 traffic deaths. Man, who fell on slippery walk, lay unnoticed for 2 hours and succumbed to exposure. George Washington Bridge closed for several hours after 4 p.m. on 9th because of falling ice, which had smashed through many wind-shields. Re-routed traffic jammed tunnels and ferries. Major damage was to power and communications facilities. 70,000 homes, institutions, and businesses without power during storm, and even 1 week later some 5,000 properties had not had restoration of utilities. Crop damage includes damage to fruit trees (peach hardest hit) and landscaping.
Westchester and Rock- land Coun- ties, N.Y.	9-10								Ice (freez- ing rain)	Heavy icing from freezing rain broke trees, and communication and power lines. Thousands of services interrupted.
Bynum (4 miles south- southeast of), Mont.	11	11 a.m.- 5 p.m.					300		Wind	
Manistee, Mich.	11	P.m.					4,000		do	Winds up to 70 m.p.h. in gusts blew down part of Quonset-type shed, several store windows, trees, and a few utility lines.
Lofalls (Hood Canal area), Kit- sap County, Wash.	11						40,000		Rain	A landslide, as a result of continuous heavy rains, destroyed a \$25,000 home and 400 feet of State Highway along Hood Canal.
Minnesota, central and southern counties	13-15						75,000		Ice (glaze), sleet, snow, and wind	Many poles and wires down. Communication and electric power services seriously disrupted. Some damage to trees. Traffic seriously delayed. Some highways, main roads, and many side roads blocked. A number of traffic accidents occurred. Some rural schools closed. Near-blizzard conditions reported in a number of localities. Heaviest ice formation was in Mankato-Fairmont area. Loss to overhead wire-systems estimated at \$75,000.
Iowa, north- western, northern, and central portions	14-15	All day							Ice (glaze), followed by cold wave	Glaze accumulated in northwest, locally to a thickness of 2 inches. Telephone lines down in north-west and north-central, with 571 toll circuits and 1,200 rural stations serving 25 communities out. Winds reached 40 to 50 m.p.h. Commercial air flights cancelled, bus travel delayed, and some rural schools closed.
Utah, north- central portion	14	Most of day			None ex- cept in auto ac- ci- dents				Snow	Snowstorm broke several precipitation intensity records at Salt Lake City and did considerable damage in north-central Utah, particularly in Salt Lake City area. It followed a period of abnormally warm weather. Storm established new January precipitation records of 0.31 inch in 1 hour, 0.60 in 2 hours 0.90 in 3 hours, 1.30 in 6 hours, 2.07 in 12 hours, and 2.40 in 24 hours. These 6- and 12-hourly amounts were new records also for any time of the year. 14.7 inches of snow set a new 24-hour record for January. Wet, heavy snow snarled traffic,

# SEVERE STORMS

Table 4—Continued

JANUARY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Utah, north- central portion (Cont'd.)	14									causing delays and accidents; caved in roofs, causing tens of thousands of dollars in damage; broke down signs and marquees, which in turn broke windows; shattered trees and shrubs; and devastated power and communication lines from Kaysville (about 20 miles north of Salt Lake City) to American Fork (about 25 miles south of Salt Lake City).
South Dakota	14-15	Night of 14th and day of 15th							Snow and wind	Blizzard with sub-zero temperatures and winds to 50 m.p.h. Schools closed, transportation halted, and communication lines broken. Northwestern Bell Telephone Company reported damage of \$8,000 as 224 circuits were out. 9 towns isolated from long-distance service. 120 out of 320 long-distance lines in southeast were out, delaying service 6 hours. By noon of 15th, conditions bettered in western half of State and cleared in east by night. 3 to 7 inches of new snow had fallen and drifted badly.
Wisconsin, northwest- ern portion	15	Day							do	From 5 to 14 inches of snow, whipped by 40 m.p.h. gales, and accompanied by rapidly falling temperatures, disrupted highway travel. Worst conditions prevailed from Burnett County to City of Ashland and Chequamegon Bay area. Many schools closed after noon of 15th. Near-blizzard conditions halted public transportation in Ashland and other cities in that area. Farther east freezing rain made highways very slippery. Icy roads also reported in other areas of State.
Wisconsin, southern and eastern portions	17	Day			1				Snow	Many traffic accidents attributed to slippery streets and highways. In Milwaukee County there were more than 250 traffic accidents, and damage in about 150 of these exceeded \$25.
Michigan, southern portion	17	P.m.			9	Sev- er- al			Ice (glaze)	Several automobile accidents attributed to icy roads caused deaths and injuries. 3 died in accident near Williamston.
New York, central portion	17								Ice (freez- ing rain) and wind	Ice coated communication and power lines, interrupting services to hundreds of homes. Highways glazed and treacherous.
Bainbridge (near), Decatur County, Ga.	18	12:45- 12:50 p.m.	200	1			\$1,500		Wind	At Bainbridge Air Base, gusty winds estimated at 75 m.p.h. or more, caused substantial damages to 20 or more airplanes which were jerked loose from moorings and banged against each other and along ground; other miscellaneous small damages occurred, including 20 to 30 pine trees blown down. Storm moved northeastward.
Oregon, most of State	19-20		State- wide	State- wide	0		750,000	Negligible	Wind and rain	High winds along coast and in Corvallis area caused damage roughly estimated at \$750,000. Greatest wind damage in Corvallis area where wind estimated to be in excess of 100 m.p.h. ripped through city block tearing roofs off of several large buildings, caving in plate-glass windows, knocking down power lines, tearing marquees and awnings off of theaters and stores; 1 large school badly damaged; estimates placed damage here near \$500,000. Elsewhere, trees blown across power lines; high winds battered through sea walls along coast; and rising rivers together with waves driven through battered walls served to isolate several large towns along coast, including Brookings, Gold Beach, and Bandon. Power interrupted for a considerable time in coastal area.
Colbert and Lauderdale Counties, Ala.	20	Early af- ternoon	70	3			5,000		Thunder- storms	Storms occurred in Muscle Shoals-Florence-Tusculumbia area.
Cordova (near), Walker Coun- ty, Ala.	20	3 p.m.	50	1-1/2	0	0	5,000		Tornado	Several residences severely damaged; several out-buildings and barns damaged.
Bethany Com- munity (near Mc- Minnville), Warren Coun- ty, Tenn.	20	5:41 p.m.	500	1/2	0	0	22,000		do	A report from the Southern Standard stated that first notice of storm came in form of a "low whistling noise". It then struck with the roar of a hundred empty railroad cars and lasted for about 2 minutes. Storm sheared tops from 5 barns, destroyed farm buildings, smashed 3 airplanes parked at Memorial Airport, damaged residence, and uprooted large trees. Heavy rainfall deluged farm buildings and overflowed floor of airport administration building. Electric and telephone services disrupted.

# SEVERE STORMS

Table 4--Continued

JANUARY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Zion Hope to Harding Communi- ties, Tift County, Ga.	20	9:30 p.m.	100 to 200	9	0	1	\$6,600	Slight	Tornado	Moved east-northeastward from Zion Hope to Harding communities. Heaviest losses in Zion Hope area, where 2 homes heavily damaged, several barns destroyed, and moderate damages to other buildings. Numerous trees and utility lines blown down along storm path. Moderate to severe damages to cabins at tourist camp north of Tifton, and mostly light damages at Harding where storm ended.
Harris Coun- ty, Ga.	20	10:30 p.m.				1		Slight	do	Information not yet obtained.
Pottsville, Pa.	22	1:55 a.m.				1	50,000		Rain	Saturated hillsides plus alternate freezing and thawing and additional rain resulted in landslide of an estimated 100 tons of debris. Rocks, the size of an automobile, rolled through gas station, and trees crashed down on it and 2 cars. Gas station attendant injured by broken glass.
Plainview area, Hale County, Tex.	22	10 a.m.					5,000		Snow	Principal damage to telephone lines and poles.
Sabine Par- ish, La.	22	4 p.m.					8,000		Thunder- squall	
Humphreys County, Miss.	22	11:45 p.m.	100	12	0	0	100,000	\$ 0	Tornado	Moved from near Louise through Midnight to near Silver City communities; 12 homes and 51 other buildings destroyed; 38 homes and 46 other buildings damaged.
New Mexico, eastern portion	22								Winds and snow	High, straight winds and blowing snow. Some highways blocked and power and telephone lines down, isolating some communities for as long as 10 hours.
St. Charles Parish, La.	23	2 a.m.				1	Minor		Thunder- squall	Man injured when limb of tree fell across his car on highway 90 near Boutte.
Harrison County, Miss.	23	4 a.m.				2	15,000		Electri- cal	2 injuries occurred when lightning-struck tree demolished automobile. Some damage in Gulfport, Hattiesboro, and Mississippi City.
Clarke Coun- ty, Ala.	23	5 a.m.	300	6	0	0	39,000		Tornado	Storm occurred in St. Stephens-Lock No. 1 section. 3 residences completely wrecked; 9 outhouses blown away; over 30,000 feet of timber destroyed. Some poultry killed. 1 automobile destroyed and 2 damaged.
Sandpoint, Idaho	23								0 Ice	Power outages; some rural areas without service for about 20 hours.
Michigan, southern portion	24-25					7			Ice (glaze)	Deaths result of automobile accidents on icy roads.
McCammon, Idaho	25	11:30 p.m.							0 Wind	Signs downed; tree branches broken off.
Alaska, south-cen- tral portion	25-26						9,500		do	Extreme high pressure over northern Alaska coupled with an intense storm in Gulf of Alaska caused high pressure gradient and northerly gale winds in most of south-central Alaska. At Homer and Naptowne winds blew down a number of trees and chimneys; several roofs blown off and a hay shed and garage demolished in Matanuska Valley; damages estimated at \$5,500. Wind sandblasted neon signs in Palmer area driving some sand particles clear through glass with breakage occurring when small pebbles carried by wind hit glass. Damage to neon signs placed at \$2,000 in Palmer and Anchorage areas. Swinging power lines and trees falling across other lines caused several power failures in Anchorage area amounting to \$1,600 damage. Freeze damage to water pipes and drainage systems resulted from unusually high winds and sub-zero temperatures. At Anchorage Weather Bureau Airport Station fastest mile of wind recorded at 60 m.p.h., the fastest mile ever observed at that station in January, with a maximum observed gust of 72 m.p.h.
Houston and vicinity, Tex.	31	4:50 p.m.	1,000	15			200,000		do	Severe thunderstorm accompanied cold front passage. Trace of hail, but all damage from high wind (peak gust 88 m.p.h. at Airport). Plate-glass windows broken; house under construction blown down; heavy damage to roofs in metropolitan area.
Lake City (8 miles south of), Fla.	31	7 p.m.	800						Hail	Heavy hail damaged tobacco beds and was a traffic hazard on U. S. Highway 41 for some time.



# SEVERE STORMS

Table 4-Continued

JANUARY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		

## LATE REPORTS:

Dauphin and Lancaster Counties, Pa.	Dec. 1	Afternoon				4			Snow	Snow-packed slippery roads and sidewalks resulted in several traffic accidents. 2 persons injured when their truck skidded over an embankment. 1 person injured in fall on icy sidewalk, and another injured in sledding accident.
Pennsylvania, south-central counties	Dec. 2	Daytime				6			do	Slippery roads resulted in numerous traffic accidents.



# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

JANUARY 1953

Major floods occurred in the coastal streams of Northern California, Oregon and Washington during January. The flood in the Klamath River was higher than the floods of 1945 and 1950, and about equal to the extreme flood of 1927. The flooding in Oregon was severe west of the Cascades. Flooding elsewhere was mostly minor.

**ATLANTIC SLOPE.**—Flash floods developed in the southern portion of the Connecticut River Basin during the night of the 24–25th from snow-melt and heavy rains (1½ and 2 inches). The main stem of the Connecticut River approached within 0.7 foot of flood stage at Hartford, Conn.

The flooding in the Susquehanna and Chenango River Basins was due mostly to snow-melt as the rain on the 24th and 25th was too light to cause any significant change. The warm temperature, which set a new high temperature record for the City of Binghamton, N. Y., during that period contributed to the rapid snow-melt. No flood damage was reported from the slight overflows.

Heavy rains and melting snow on the 24th and 25th resulted in the flooding of small streams during the night of the 24th and 25th throughout southeastern and east-central New York.

Floating and shore ice was reported from a number of river stations on the Susquehanna River during most of the month and solid ice in the upper West Branch during the first half of the month. Snow cover at the end of the month was light and confined to the mountainous and northern parts of the basin.

The flooding in the streams in eastern North Carolina was due to heavy rain during the periods Dec. 30 to 31, Jan. 8–10 and Jan. 22–23. The rain during each of these periods averaged from 1 to 2 inches. No important losses were reported from the overflows. However, the high water interrupted logging operations on the lower Roanoke and caused delays in river traffic on the Cape Fear.

Minor flooding occurred on the Apalachicola River from the 13th to the 17th due to light to moderate rain on the 9th. The Chattahoochee River reached near flood stage on the 11th. No damage resulted.

**EAST GULF OF MEXICO.**—Heavy rainfall during the period from the 8th to the 11th caused moderate flooding in the upper Coosa and upper Cahaba Rivers between the 9th and 13th. Heavy overflows resulted in local creeks and streams from the excessively heavy rainfall in the Anniston-Childersburg-Gadsden, Ala., area.

This same storm caused flooding along portions of the Black Warrior, Tombigbee and Pearl Rivers. The rainfall over the Warrior averaged around 5 inches on the 9th and 10th. In the Tombigbee basin the heavy rain was confined to the lower reaches of the river.

**Ohio Basin.**—The only flooding in the Ohio Basin during the month was on Paint Creek (Scioto Basin) at Bourneville, Ohio, on the 28th and in the Tennessee Basin on Chickamauga Creek from the 9th to the 12th. No damages resulted.

**Red Basin.**—Light flooding occurred on the Ouachita River at Arkadelphia and Camden, Ark., from the heavy general rains (2 inches) on 22–23d. No damage resulted from the overflows.

**CALIFORNIA COAST DRAINAGE.**—The heavy rains on the 8th and 9th caused moderate flooding on the Russian River on the 9–10th. The rainfall amounts during the 24-hour period ranged from 2.28 inches at Guerneville to 2.87 inches at Healdsburg, Calif. The Corps of Engineers estimates the total damage

in the Russian River basin at \$170,000. Most of this damage was due to erosion of agricultural lands with some light crop damage and losses from Roadblocks.

Rainfall amounts during the month were generally above normal in the Sacramento Basin, with some stations on the headwaters of the Feather River receiving as much as 240% of the January normal. Most of this precipitation occurred during the first two decades of the month in a series of storms. The first of the series moved across the basin on the 2d of the month, the second between the 6th and 14th and the third between the 17th and 21st. The rain fell at much higher elevations than usual as the prevailing weather pattern was mostly of a westerly and southwesterly type as compared to northwesterly in December.

The highest crest in over 10 years was recorded on the Feather River. More unusual, however, was the extremely high flow which lasted over 12 hours which was probably due to the delaying action of a deep snow pack on rainfall and resulting runoff. The only danger point on the Feather River is at Gridley Bridge (between Oroville and Marysville, California) where natural overflow takes place over an area devoted mostly to farming, which is also being used as a large work camp. No loss of life and no appreciable loss of property was reported.

The high flow on the Feather, together with increased releases from Shasta Dam and heavy flow below Shasta Dam, caused the first overflow of the season on the Sacramento River at Fremont Weir into Yolo Bypass flooding Little Holland Island on the 11th and Prospect Island on the 12th. There was no loss of life or property and the loss of crops will be insignificant.

Farther downstream, the high flow on the Sacramento occurred at the same time as the spring tide in the Delta. The wind was light and variable during the critical period and no levee breaks occurred.

Two major floods occurred on the Eel River in California. The first occurred on the 9th and 10th and the second on the 18th and 19th. This second storm caused flooding in practically every stream from Point Delgada, Calif., northward along the Oregon Coast. Rainfall was heavy during December and the first part of January. The rainfall between the 6th and 8th averaged 1.5 inches during each 24-hour period. During the 24-hour period ending at 8 a.m., on the 9th, the rainfall averaged over 3 inches. The second storm struck the north coastal areas of California and Oregon late on the 16th and continued through the 18th, with the heaviest amounts occurring from Eureka northward. The average precipitation was about 12 inches west of the coast range with extremes of 16.61 inches at Klamath, California east of the coast range and to the peak of the Cascades, the average was around 4 inches. Heavy runoff occurred from the Van Duzen River which empties into the Eel River a few miles above Fernbridge, Calif. Flooding was severe on Redwood Creek, lower Klamath River and Smith River in California. On the Klamath River near Klamath, Calif., the January 18th discharge was 280,000 SF (provisional data) compared with the previous peak flow of 197,000 SF on Feb. 2, 1952. The Salmon River at Somes Bar reached 41,000 SF on the 18th compared with the previous high of 29,900 SF on Dec. 28, 1945, while the Klamath River at Somes Bar reached 137,000 SF. The damage to fields and country roads was heavy. There was

# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS—Continued

JANUARY 1953

very little loss of property. No deaths occurred directly as a result of the flood but a work train on the Northwestern Pacific Railroad was caught by a land-slide and three trainmen were killed. Inundation damage along the Smith River in California and the Rogue Umpqua Basins in Oregon appears to have been very light to moderate stages being lower on the Smith and Umpqua than in October 1952, but highest since 1927 on the Rogue. Crests at Grants Pass, Oreg., were 4 feet lower than the 1927 figure of 28 feet.

Columbia Basin.—Serious flooding developed in streams in the Willamette Valley from the heavy rains (over 5 inches average) which occurred from the 17th to the 20th. Some of the heaviest rainfall amounts reported were: Detroit, Oreg., 9.63 inches; Three Lynx, 8.44 inches; Falls City, Oreg., 8.02 inches. Runoff was high as precipitation was generally above normal during December and in January. Precipitation at intermediate and higher

elevations was much heavier than on the valley floors. There was considerable runoff from snow-melt even though the snow cover was lighter than anything experienced for several years for that time of year. The minimum temperatures were generally well above freezing even at the higher elevations and the maximum temperatures ranged from the higher 40's to near or above 60°.

Considerable damage resulted from the flooding. PUGET SOUND AND WASHINGTON COAST DRAINAGE.—Major flooding occurred in the Snohomish and Snoqualmie Valleys in Washington on the 12th, 23d, and 31st. Minor flooding occurred in the Green River Valley on the 23d and 31st; in the Stillaquamish Valley on the 31st and in the Snohomish and Snoqualmie Valleys on the 9th and 18th. The stages reached in all streams were approximately 2 feet lower than those reached in the February 1951 flood. Damages from the flooding were comparatively light.



# FLOOD STAGE DATA

(All dates in January unless otherwise specified)

Table 5

JANUARY 1953

River and station	Flood stage	Above flood stages -dates		Crest *	
		From-	To-	Stage	Date
ATLANTIC SLOPE DRAINAGE					
Tioughnioga: Whitney Point, N.Y.	12	25	27	†12.7	24
Chenango:					
Sherburne, N.Y.	8	24	25	8.4	24
Green, N.Y.	11	24	26	11.4	25
Susquehanna:					
Oneonta, N.Y.	12	24	26	15.2	25
Bainbridge, N.Y.	13	25	26	16.6	25
Roanoke: Williamston, N.C.	10	14	17	10.1	16
		28	Feb. 3	10.8	Feb. 1
Neuse:					
Neuse, N.C.	14	1	3	#14.3	3
		10	13	#15.0	12
		24	28	#16.2	27
Smithfield, N.C.	13	1	4	#14.9	4
		11	14	#15.1	13
		24	29	17.0	27
Goldsboro, N.C.	14	29	Feb. 2	#15.1	Feb. 1
Cape Fear: Lock No. 2, Elizabethtown, N.C.	20	1	5	24.7	3
		10	14	24.6	12
		24	29	25.6	26
EAST GULF OF MEXICO DRAINAGE					
Apalachicola: Blountstown, Fla.	15	13	17	15.9	15
Coosa:					
Gadsden, Ala.	20	10	13	22.2	11
Childersburg, Ala.	20	11	11	20.8	11
Cahaba: Centreville, Ala.	23	9	11	24.5	10
Black Warrior: Tuscaloosa, Ala.	47	9	11	53.5	10
Tombigbee:					
Demopolis, Ala.	39	13	15	40.1	14
Lock 3, Whitefield, Ala.	33	11	17	41.5	15
		26	30	38.9	27-28
Pearl:					
Jackson, Miss.	18	23	30	19.3	25
Bogalusa, La.	15	19	31	16.9	27
MISSISSIPPI SYSTEM					
Ohio Basin					
Paint Creek: Bourneville, Ohio	10	28	28	11.3	28
South Chickamauga Creek: Chicka- mauga (nr.), Tenn.	10	9	12	12.7	11
Red Basin					
Ouachita:					
Arkadelphia, Ark.	17	24	24	17.5	24
Camden, Ark.	26	26	26	26.0	26
PACIFIC SLOPE DRAINAGE					
Sacramento Basin					
Sacramento:					
Moulton Weir	76.8	9	28	79.3	11
				80.3	14
				80.5	22
Colusa Weir	61.8	1	30	66.3	11
				66.7	14
				66.7	19
				66.7	22
Tisdale Weir	45.5	1	31	48.1	1
				50.0	23
Fremont Weir	33.8	■	31	37.0	11
				37.1	15
				37.0	22
Rio Vista, Calif.	9.0	--	--	9.0	13
				9.1	14
Russian Basin					
Russian:					
Bealdsburg, Calif.	19.0	9	9	19.2	9
Guerneville, Calif.	29.5	9	10	34.2	9
Eel Basin					
Eel: Fernbridge, Calif.	17.5	9	10	22.1	9
		18	19	20.8	18

River and station	Flood stage	Above flood stages -dates		Crest *	
		From-	To-	Stage	Date
PACIFIC SLOPE DRAINAGE--Cont.					
Columbia Basin					
McKenzie:					
Leaburg, Ore.	12	17	21	20.5	18
Walterville, Ore.	13	18	18	13.8	18
Coburg, Ore.	11	18	19	16.9	19
Calapooya: Holley, Ore.	10.5	18	18	11.8	18
Santiam: Jefferson, Ore.	13	9	9	15.9	9
		13	14	13.6	14
		17	23	20.6	18
South Yamhill: Whiteson, Ore.	38	19	22	41.4	19
Mollala: Canby, Ore.	10	9	9	12.2	9
		18	20	12.0	19
Tualitan: Dilley, Ore.	12	9	9	12.2	9
		12	12	12.2	12
		17	24	12.6	23
Willamette:					
Eugene, Ore.	12	18	19	13.9	19
Harrisburg, Ore.	12	10	10	12.7	10
		17	22	18.0	19
Corvallis, Ore.	20	19	22	26.4	19
Albany, Ore.	20	19	22	28.0	20
Salem, Ore.	20	19	22	26.2	20
Oregon City, Ore.	12	19	25	17.3	21
Portland, Ore.	18	20	22	20.2	21
Cowlitz: Randle, Wash.	10	12	13	14.7	12
Columbia: Vancouver, Wash.	15	20	24	17.2	23
Rogue:					
Dodge Bridge, Ore.	9	18	19	12.0	18
Raygold, Ore.	10.5	18	19	17.8	18
Grants Pass, Ore.	17	18	19	24.0	18
Umpqua:					
Winston, Ore.	28	18	19	30.4	18
Roseberg, Ore.	20	18	19	26.1	19
Elkton, Ore.	?	18	19	†43.0	19
Smith: Fort Dick IN, Ore.	30	17	19	36.0	18
PUGET SOUND BASIN					
Green: Auburn, Wash.	63	23	23	64.7	23
		31	Feb. 1	64.7	Feb. 1
Snoqualmie: Carnation, Wash.	51.5	9	10	52.9	9
		11	13	54.3	12
		18	19	52.8	19
		23	25	56.5	24
		31	Feb. 2	56.4	Feb. 1
Snohomish: Snohomish, Wash.	23.6	9	10	24.7	9
		12	13	27.8	13
		19	19	24.5	19
		23	25	28.4	24
		31	Feb. 1	28.2	Feb. 1
Stillaquamish: Arlington, Wash.	16	31	31	16.9	31

\* Provisional.  
† Estimated.  
# Highest stage observed.

\* Provisional.

† Estimated.

# Highest stage observed.

# RADIOSONDE DATA

Average monthly values

JANUARY 1953

Table 20

ALBUQUERQUE, N. MEX. ( 840 MB.)				ATLANTA, GA. ( 981 MB.)				BIG SPRING, TEX. ( 926 MB.)				BISMARCK, N. DAK. ( 954 MB.)				BOISE, IDAHO ( 918 MB.)				BROWNSVILLE, TEX. (1017 MB.)				BUFFALO, N. Y. ( 987 MB.)								
Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)								
Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations								
Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height								
Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				Temperature								
Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity								
SURFACE				31	1,629	5.9	44	31	309	8.2	78	31	784	10.3	38	31	505	- 9.6	82	31	868	4.8	78	31	7	16.0	73	31	221	- 0.8	82	
1,000	31	160		31	150			31	150			31	134		31	133			31	164			31	154	17.6	64	31	116				
950	31	595		31	578	9.0	65	31	571			31	571		31	537	-10.1	76	31	591			31	601	16.3	52	31	531	-1.3	74		
900	31	1,051		31	1,022	6.7	60	31	1,024	13.1	27	31	956	- 4.8	67	31	956	- 4.8	67	31	1,031	5.8	65	31	1,051	15.0	39	31	957	-2.8	72	
850	31	1,519		31	1,489	5.0	56	31	1,502	11.2	25	31	1,406	- 4.1	61	31	1,406	- 4.1	61	31	1,498	3.8	61	31	1,533	13.6	27	31	1,409	-4.0	71	
800	31	2,017	5.1	36	31	1,982	2.8	55	31	2,006	8.4	26	31	1,884	- 4.1	58	31	1,988	.9	62	31	1,988	.9	62	31	2,041	11.3	24	31	1,886	-5.7	67
750	31	2,544	2.1	36	31	2,512	1.0	47	31	2,541	4.9	27	31	2,397	- 6.4	56	31	2,509	-2.4	63	31	2,588	8.8		31	2,588	8.8		31	2,401	-7.3	62
700	31	3,094	-1.4	38	31	3,054	-1.8	45	31	3,094	1.7	25	31	2,927	- 9.7	54	31	3,048	-5.8	62	31	3,048	-5.8	62	31	3,144	5.6		31	2,925	-9.9	60
650	31	3,681	-5.1	39	31	3,646	-4.8	39	31	3,691	-2.0	25	30	3,507	-13.0	53	31	3,632	-9.2	60	31	3,632	-9.2	60	31	3,751	1.8		31	3,500	-12.6	55
600	31	4,305	-8.7	37	31	4,266	-8.5	36	31	4,319	-6.0		30	4,105	-16.9	53	31	4,240	-13.0	63	31	4,240	-13.0	63	31	4,385	-2.5		31	4,101	-16.1	50
550	31	4,975	-12.9	34	31	4,940	-13.0	34	30	4,996	-10.7		29	4,761	-21.0	51	31	4,902	-17.2	65	30	4,902	-17.2	65	30	5,073	-7.4		30	4,751	-20.3	46
500	31	5,693	-18.2	35	31	5,654	-18.1	31	30	5,718	-15.9		29	5,451	-25.3	47	31	5,606	-21.8	64	30	5,606	-21.8	64	30	5,806	-12.5		29	5,445	-25.1	45
450	31	6,475	-23.9	37	31	6,440	-23.8		30	6,507	-21.8		29	6,214	-31.0	45	31	6,379	-27.1	63	29	6,379	-27.1	63	29	6,612	-18.5		29	6,204	-30.6	40
400	31	7,321	-29.9		31	7,283	-29.6		30	7,359	-28.3		29	7,033	-37.1	47	31	7,212	-33.2	64	28	7,470	-25.2		29	7,029	-36.8		29	7,029	-36.8	
350	31	8,259	-36.7		31	8,222	-36.5		30	8,301	-35.6		29	7,942	-43.8		31	8,137	-39.9	63	27	8,425	-32.5		29	7,940	-43.2		29	7,940	-43.2	
300	31	9,310	-44.0		31	9,274	-43.8		30	9,357	-43.6		29	8,959	-51.4		31	9,173	-47.7		27	9,492	-40.4		29	8,966	-48.5		29	8,966	-48.5	
250	31	10,514	-51.2		31	10,481	-50.2		29	10,563	-50.3		29	10,126	-56.3		30	10,354	-55.5		27	10,714	-47.5		27	10,157	-53.1		27	10,157	-53.1	
200	31	11,946	-57.0		29	11,918	-55.8		29	12,001	-54.8		28	11,557	-63.5		30	11,758	-58.6		27	12,166	-53.7		27	11,576	-52.7		27	11,576	-52.7	
175	31	12,789	-57.6		29	12,772	-55.2		28	12,848	-56.3		28	12,417	-62.5		30	12,660	-56.9		26	13,017	-57.5		22	12,432	-52.4		22	12,432	-52.4	
150	31	13,757	-59.7		29	13,751	-57.6		27	13,821	-58.7		28	13,411	-65.3		30	13,578	-60.6		26	13,979	-62.0		22	13,426	-53.2		22	13,426	-53.2	
125	30	14,892	-63.1		27	14,886	-62.2		26	14,950	-63.4		27	14,586	-69.9		30	14,729	-68.7		25	15,090	-67.2		19	14,564	-54.7		19	14,564	-54.7	
100	30	16,250	-67.3		24	16,251	-65.8		24	16,312	-67.8		25	16,012	-75.9		27	16,120	-70.3		23	16,419	-71.8		17	15,996	-58.0		17	15,996	-58.0	
80	27	17,579	-68.4		23	17,594	-67.1		22	17,647	-68.8		24	17,416	-75.5		20	17,510	-72.1		21	17,726	-72.5		16	17,398	-59.0		16	17,398	-59.0	
60	18	19,300	-66.4		16	19,323	-65.9		15	19,370	-67.6		18	19,204	-79.8		14	19,285	-81.6		19	19,427	-69.0		12	19,183	-60.1		12	19,183	-60.1	
50	16	20,401	-65.0		14	20,429	-64.2		12	20,472	-65.7		13	20,347	-80.4		11	20,423	-82.4		16	20,529	-69.9		8	20,355	-61.0		8	20,355	-61.0	
40	12	21,779	-62.8		8	21,785	-61.1		10	21,834	-63.7		11	21,728	-86.2		5	21,830	-81.2		9	21,905	-60.7		8	21,738	-60.0		8	21,738	-60.0	

BURRWOOD, LA. (1019 MB.)				CARIBOU, MAINE ( 991 MB.)				CHARLESTON, S. C. (1017 MB.)				COLUMBIA, MO. ( 987 MB.)				DODGE CITY, KANS. ( 923 MB.)				EL PASO, TEX. ( 984 MB.)				ELY, NEV. ( 812 MB.)								
Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)								
Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations								
Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height								
Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				Temperature								
Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity								
SURFACE				31	3	14.5	83	31	191	- 9.5	75	31	13	10.1	83	31	238	0.7	76	31	792	3.4	63	30	1,195	11.0	30	31	1,908	- 0.7	72	
1,000	31	159	14.9	72	31	118	-14.4		31	153	12.7	70	31	129			31	133			30	146			31	195		31	195			
950	31	592	12.6	64	31	522	- 8.5	70	31	586	10.7	60	31	543	.5	72	31	555			30	585			31	628		31	628			
900	31	1,044	10.4	58	31	936	- 8.4	70	31	1,032	7.9	60	31	975	1.5	64	31	1,000	7.2	41	30	1,042			31	1,069		31	1,069			
850	31	1,518	8.5	49	31	1,379	- 8.6	64	31	1,379	5.5	53	31	1,436	1.9	55	31	1,469	6.1	37	30	1,522	12.6	23	31	1,532		31	1,532			
800	31	2,018	6.9	39	31	1,848	- 9.4	61	31	1,995	3.8	51	31	1,924	- 6.46	46	31	1,964	4.2	35	30	2,026	9.4	24	31	2,024		24	31	2,024		
750	31	2,552	5.0		31	2,552	-10.7	55	31	2,523	1.5	44	31	2,447	- 2.0	45	31	2,490	1.3	34	30	2,560	5.8	26	31	2,548		31	2,548			
700	31	3,106	2.3	34	31	2,872	-12.7	53	31	3,070	1.3	36	31	2,985	-5.0	39	31	3,085	2.3	37	30	3,117	-7.5	24	31	3,096		31	3,096			
650	30	3,704	-1.1		29	3,439	-15.6	49	31	3,659	-4.0	31	31	3,571	- 8.4	36	31	3,625	-6.1	39	30	3,714	-1.1	24	31	3,687		31	3,687			
600	30	4,335	-4.9		29	4,030	-18.8	45	31	4,285	-7.8		31	4,181	-12.1	35	31	4,243	-10.2	39	30	4,345	-5.5		31	4,306		31	4,306			
550	29	5,008	-9.7		29	4,678	-22.7	43	31	4,957	-12.2	31	31	4,842	-16.4	33	31	4,909	-14.7	40	30	5,019	-10.2		31	4,975		31	4,975			
500	29	5,738	-15.2		29	5,365	-27.1	44	31	5,677	-17.4	34	31	5,551	-21.4	34	31	5,622	-19.5	40	30	5,747	-15.7		31	5,692		31	5,692			
450	29	6,531	-21.3		29	6,122	-32.3	43	30	6,461	-22.9		31	6,325	-27.2	38	31	6,399	-25.4	40	30	6,533	-21.5		31	6,476		31	6,476			
400	28	7,381	-27.9		29	6,939	-37.8		30	7,308	-29.2		31	7,157	-33.6	42	31	7,239	-31.9	37	30	7,390	-27.9		31	7,320		31	7,320			
350	28	8,326	-34.7		29	7,846	-44.0		30	8,248	-35.7		31	8,079	-40.8		31	8,169	-38.4		30	8,333	-35.0		31	8,255		31	8,255			
300	28	9,384	-42.2		28	8,872	-49.8		30	9,302	-42.8		31	9,110	-48.4		31	9,212	-45.9		30	9,390	-42.5		31	9,301		31	9,301			
250	26	10,595	-48.6		28	10,053	-53.2		31	10,514	-50.2		31	10,293	-53.7		31	10,405	-52.3		30	10,599	-50.3		30	10,493		30	10,493			
200	26	12,043	-53.8		27	11,493	-53.0		29	11,964	-54.4		31	11,724	-53.9		31	11,840	-54.8		30	12,031	-56.4		31	11,907		31	11,907			
175	26	12,894	-56.8		26	12,355	-52.1		29	12,814	-56.3		31	12,581	-53.9		31	12,692	-54.9		30	12,875	-57.9		29	12,740						

	BURRWOOD, LA. (1019 MB.)				CARIBOU, MAINE (991 MB.)				CHARLESTON, S. C. (1017 MB.)				COLUMBIA, MO. (987 MB.)				DODGE CITY, KANS. (923 MB.)				EL PASO, TEX. (884 MB.)				ELY, NEV. (812 MB.)			
SURFACE	31	3	14.5	83	31	191	-9.5	75	31	13	10.1	83	31	238	0.7	76	31	792	3.4	63	30	1,195	11.0	30	31	1,908	-0.7	72
1,000	31	159	14.9	72	31	118	-14.4		31	153	12.7	70	31	129			31	133			30	146			31	195		
950	31	592	12.6	64	31	522	-8.5	70	31	586	10.7	60	31	543	.5	72	31	555			30	585			31	628		
900	31	1,044	10.4	58	31	936	-8.4	70	31	1,032	7.9	60	31	975	1.5	64	31	1,000	7.2	41	30	1,042			31	1,069		
850	31	1,518	8.5	49	31	1,379	-8.5	64	31	1,501	5.5	53	31	1,436	1.9	55	31	1,469	6.1	37	30	1,522	12.6	23	31	1,532		
800	31	2,018	6.9	39	31	1,848	-9.4	61	31	1,995	3.8	51	31	1,924	.6	46	31	1,964	4.2	35	30	2,026	9.4	24	31	2,024	3.1	58
750	31	2,552	5.0		31	2,354	-10.7	55	31	2,523	1.5	44	31	2,447	-2.0	45	31	2,490	1.3	34	30	2,560	5.8	26	31	2,548	1.2	50
700	31	3,106	2.3		31	2,874	-12.7	53	31	3,070	-1.2	36	31	2,985	-5.0	39	31	3,037	-2.3	37	30	3,117	2.5	24	31	3,096	-2.0	47
650	30	3,704	-1.1		29	3,439	-15.6	49	31	3,659	-4.0	31	31	3,571	-8.4	36	31	3,625	-6.1	39	30	3,714	-1.3	24	31	3,687	-1.5	45
600	30	4,335	-4.9		29	4,030	-18.8	45	31	4,285	-7.8		31	4,181	-12.1	35	31	4,243	-10.2	39	30	4,345	-5.5		31	4,306	-9.2	45
550	29	5,008	-9.7		29	4,678	-22.7	43	31	4,957	-12.2	31	31	4,842	-16.4	33	31	4,909	-14.7	40	30	5,019	-10.2		31	4,975	-13.5	45
500	29	5,738	-15.2		29	5,365	-27.1	44	31	5,677	-17.4	34	31	5,551	-21.4	34	31	5,622	-19.5	40	30	5,747	-15.7		31	5,692	-18.3	40
450	29	6,531	-21.3		29	6,122	-32.3	43	30	6,461	-22.9		31	6,325	-27.2	38	31	6,399	-25.4	40	30	6,533	-21.5		31	6,476	-23.7	37
400	28	7,381	-27.9		29	6,939	-37.8		30	7,308	-29.2		31	7,157	-33.6	42	31	7,239	-31.9	37	30	7,390	-27.9		31	7,320	-29.8	37
350	28	8,326	-34.7		29	7,846	-44.0		30	8,248	-35.7		31	8,079	-40.8		31	8,169	-38.4		30	8,333	-35.0		31	8,255	-37.2	35
300	28	9,384	-42.2		28	8,872	-49.8		30	9,302	-42.8		31	9,110	-48.4		31	9,212	-45.9		30	9,390	-42.5		31	9,301	-45.4	
250	26	10,595	-48.6		28	10,053	-53.2		31	10,514	-50.2		31	10,293	-53.7		31	10,405	-52.3		30	10,599	-50.3		30	10,493	-54.2	
200	26	12,043	-53.8		27	11,493	-53.0		29	11,964	-54.4		31	11,724	-53.9		31	11,840	-54.8		30	12,031	-56.4		29	11,907	-59.8	
175	26	12,894	-56.8		26	12,355	-52.1		29	12,814	-56.3		31	12,581	-53.9		31	12,692	-54.9		30	12,875	-57.9		29	12,740	-59.1	
150	25	13,862	-61.1		25	13,345	-52.1		28	13,782	-59.0		31	13,567	-55.7		31	13,674	-56.2		30	13,838	-61.2		29	13,705	-59.4	
125	25	14,977	-66.4		23	14,522	-54.2		28	14,914	-63.3		31	14,720	-58.5		30	14,826	-59.2		30	14,958	-63.3		28	14,841	-62.0	
100	22	16,317	-71.4		20	15,947	-56.1		26	16,273	-67.2		30	16,116	-61.7		28	16,215	-63.1		25	16,303	-69.3		27	16,213	-64.7	
75	17	17,620	-76.0		12	17,349	-65.9		22	17,583	-72.5		27	17,483	-68.3		25	17,630	-70.2		20	17,730	-75.2		26	17,602	-65.6	
50	13	19,321	-68.5		10	19,119	-58.6		13	19,320	-65.8		22	19,233	-63.7		15	19,342	-65.5		14	19,320	-70.2		15	19,302	-65.6	
25	10	20,424	-65.1		7	20,257	-58.9		13	20,430	-63.8		21	20,352	-63.4		11	20,458	-65.2		11	20,408	-66.8		12	20,348	-64.7	
0	8	21,777	-62.2						11	21,809	-60.1		15	21,721	-61.7		7	21,824	-63.1		8	21,764	-63.7		8	21,784	-63.9	
0									6	23,624	-54.9			5	23,535	-59.8		5	23,629	-60.8								



# RADIOSONDE DATA

Average monthly values

JANUARY 1953

Table 20-Continued

JOLIET, ILL. ( 993 MB.)				LAKE CHARLES, LA. (1018 MB.)				LANDER, WYO. ( 827 MB.)				LAS VEGAS, NEV. ( 943 MB.)				LITTLE ROCK, ARK. (1006 MB.)				MAZATLAN, MEXICO (1012 MB.)				MEDFORD, ORE. ( 972 MB.)				
Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				
Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				
Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				
Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				
Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				
SURFACE	31	179	- 2.6	85	31	5	12.2	81	31	1,696	- 0.4	57	31	660	9.7	45	31	79	7.3	74	30	14	22.2	75	31	401	5.8	89
1,000---	31	124			31	151	13.8	70	31	142			31	166			31	131	8.0	68	30	118	21.7	67	31	167		
950---	31	533	- 3.1	78	31	586	12.2	60	31	569			31	600			31	557	7.9	66	30	580	23.1	32	31	595	6.7	78
900---	31	959	- 3.0	72	31	1,034	9.9	53	31	1,012			31	1,052	12.7	35	31	1,000	7.1	64	30	1,035	21.2	27	31	1,033	6.8	64
850---	31	1,413	- 2.4	63	31	1,508	8.6	46	31	1,473			31	1,529	10.8	36	31	1,474	5.7	40	30	1,526	18.2	26	31	1,501	4.5	59
800---	31	1,894	- 3.4	57	31	2,008	7.3	33	31	1,963	2.2	46	31	2,031	7.4	37	31	1,964	3.9	50	30	2,042	15.1		31	1,992	1.3	63
750---	31	2,405	- 5.1	55	31	2,546	4.9	38	31	2,487	- 5.4	44	31	2,567	4.5	35	30	2,494	1.9	43	30	2,589	11.6		31	2,519	- 1.6	62
700---	31	2,942	- 7.8	52	31	3,096	1.7		31	3,030	- 3.6	47	31	3,118	1.7	30	30	3,042	-	38	29	3,157	7.8		31	3,056	- 4.4	52
650---	31	3,521	-11.1	51	30	3,697	- 1.5		31	3,619	- 7.5	49	31	3,716	- 2.3		30	3,635	- 3.9	37	29	3,762	3.6		31	3,644	- 7.5	45
600---	31	4,125	-14.9	47	30	4,324	- 5.6		31	4,230	-11.5	48	31	4,343	- 6.1	28	30	4,258	- 7.8	38	28	4,409	-	5	31	4,255	-11.3	44
550---	31	4,779	-19.4	46	30	4,999	-10.1		31	4,895	-15.7	45	31	5,020	-10.8	30	30	4,933	-12.1	34	28	5,095	- 5.4		31	4,923	-15.7	46
500---	31	5,478	-24.3	42	29	5,733	-15.4		31	5,604	-20.6	42	31	5,744	-15.8	32	30	5,651	-17.0	32	28	5,838	-10.8		31	5,629	-20.6	47
450---	31	6,241	-29.7	38	27	6,530	-21.2		31	6,376	-26.1	41	30	6,539	-21.9	32	30	6,439	-23.0	32	28	6,642	-16.8		31	6,409	-25.7	48
400---	31	7,067	-36.1		27	7,381	-27.6		30	7,221	-32.1	39	30	7,387	-28.6		30	7,285	-29.6	32	28	7,513	-23.1		31	7,245	-31.3	49
350---	31	7,980	-42.7		26	8,324	-35.1		30	8,149	-39.1		29	8,341	-35.6		28	8,223	-36.8		27	8,468	-74.2		31	8,176	-38.2	52
300---	30	9,002	-49.2		24	9,375	-43.2		30	9,188	-46.9		27	9,404	-43.6		29	9,282	-44.2		28	9,558	-37.7		31	9,216	-46.7	
250---	30	10,183	-53.8		20	10,605	-50.4		29	10,374	-54.3		24	10,614	-52.4		28	10,486	-50.2		28	10,791	-46.7		31	10,402	-54.4	
200---	28	11,625	-52.0		15	12,068	-54.5		26	11,775	-57.2		20	12,014	-61.1		29	11,932	-53.3		28	12,238	-55.9		31	11,813	-59.2	
175---	26	12,484	-52.4		14	12,928	-56.1		26	12,621	-55.8		16	12,810	-61.1		29	12,790	-54.2		27	13,078	-60.1		31	12,651	-57.8	
150---	25	13,483	-53.8		13	13,898	-60.1		21	13,580	-55.3		11	13,771	-60.8		29	13,774	-56.1		25	14,035	-63.6		31	13,823	-58.0	
125---	24	14,645	-56.1		12	15,004	-65.2		14	14,733	-62.2		9	14,888	-62.7		29	14,922	-60.2		22	15,148	-68.6		31	14,767	-59.9	
100---	22	16,049	-59.7		10	16,352	-70.8		13	16,141	-57.1		8	16,257	-63.2		28	16,304	-63.9		17	16,468	-74.2		31	16,144	-62.3	
80---	30	17,443	-61.4		9	17,645	-73.7		9	17,544	-59.4		6	17,604	-65.0		25	17,656	-65.7		10	17,755	-77.1		26	17,517	-63.1	
60---	17	19,234	-61.3		8	19,337	-69.8		8	19,335	-60.6						12	19,423	-66.8		9	19,420	-73.6		20	19,287	-63.1	
50---	9	20,372	-62.1		8	20,429	-67.0		7	20,472	-58.9						10	20,530	-64.4		7	20,477	-69.6		11	20,421	-63.3	
40---	6	21,730	-61.6		7	21,772	-63.1										5	21,883	-61.7		7	21,821	-64.8		6	21,831	-61.4	
30---					5	23,582	-58.5										5	23,678	-58.4		6	23,598	-59.1					
20---																					6	26,181	-52.0					

MERIDA, MEXICO (1016 MB.)				MIAMI, FLA. (1019 MB.)				NANTUCKET, MASS. (1014 MB.)				NASHVILLE, TENN. ( 995 MB.)				NORTH PLATTE, NEBR. ( 915 MB.)				OAKLAND, CALIF. (1022 MB.)				OKLAHOMA CITY, OKLA. ( 969 MB.)				
Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				Standard pressure surface (mb.)				
Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				
Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				
Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				
Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				
SURFACE	26	27	22.0	70	31	4	18.9	77	31	14	2.3	84	31	177	6.7	78	31	849	- 1.5	82	31	6	11.7	85	31	391	4.4	67
1,000---	26	162	21.7	69	31	169	18.4	72	31	126	2.7	74	31	133	6.8		31	130			31	188	12.2	76	31	132		
950---	26	607	19.1	71	31	607	15.5	74	31	541	1.8	69	31	556	6.2	65	31	550			31	621	11.1	65	31	559	6.9	57
900---	26	1,070	16.3	69	31	1,064	12.8	68	31	975	-	62	31	997	5.2	61	31	983	2.4	67	31	1,068	10.0	55	31	999	7.4	46
850---	26	1,554	13.3	69	31	1,543	10.8	59	31	1,433	-	54	31	1,462	3.2	59	31	1,447	3.5	49	31	1,542	8.3	48	31	1,469	7.3	37
800---	26	2,063	11.3	55	31	2,046	8.4	48	31	1,916	- 2.1	53	31	1,952	1.2	57	31	1,937	1.4	47	31	2,040	5.7	42	31	1,965	5.1	33
750---	26	2,603	9.5	43	31	2,585	6.5	38	31	2,433	- 4.4	53	31	2,473	-	50	31	2,458	- 1.4	48	31	2,572	2.9	36	31	2,496	2.4	34
700---	26	3,170	7.1		31	3,142	3.9		31	2,968	- 6.8	53	31	3,017	- 3.6	46	31	3,000	- 4.6	46	31	3,121	-	32	31	3,044	-	32
650---	26	3,781	3.8		31	3,745	.8		31	3,547	-10.0	49	31	3,604	- 7.2	44	31	3,583	- 8.4	46	31	3,715	- 7.7	33	31	3,641	- 4.6	33
600---	26	4,422	1.1		31	4,379	- 3.2		29	4,156	-13.9	47	31	4,217	-11.2	42	31	4,195	-12.6	48	31	4,338	- 7.9	35	31	4,258	- 8.4	30
550---	26	5,112	- 3.9		31	5,062	- 7.9		29	4,816	-18.3	43	31	4,886	-15.3	38	31	4,854	-17.2	50	31	5,011	-12.5	37	31	4,930	-12.9	29
500---	26	5,859	- 8.9		31	5,796	-13.0		29	5,516	-23.0	41	31	5,593	-19.9	39	31	5,561	-22.3	51	31	5,730	-17.4	44	31	5,647	-17.9	28
450---	26	6,670	-14.8		31	6,598	-18.8		28	6,287	-28.4	42	31	6,369	-25.4	40	31	6,328	-27.9	47	31	6,515	-23.0	47	31	6,432	-23.9	
400---	24	7,547	-21.0		31	7,459	-25.0		29	7,115	-34.2	46	30	7,208	-31.7		31	7,089	-34.1	43	31	7,364	-29.3	47	31	7,275	-30.5	
350---	22	8,520	-27.9		31	8,414	-32.0		29	8,036	-40.8		30	8,138	-38.4		31	8,083	-40.8		31	8,303	-36.4	49	31	8,208	-37.9	
300---	21	9,612	-36.2		31	9,483	-39.7		29	9,069	-47.2		30	9,182	-45.0		30	9,108	-48.4		31	9,355	-44.5		31	9,251	-45.7	
250---	21	10,852	-45.1		31	10,706	-47.5		29	10,258	-53.0		30	10,381	-51.0		30	10,287	-54.6		31	10,552	-53.0		31	10,445	-52.3	
200---	18	12,317	-53.5		31	12,154	-54.9		29	11,687	-54.6		28	11,823	-53.4		26	11,726	-55.4		31	11,967	-59.5		30	11,873	-55.1	
175---	15	13,167	-56.7		30	13,003	-58.7		29	12,543	-54.1		28	12,676	-54.0		24	12,564	-54.4		29	12,866	-58.9		30	12,724	-55.3	
150---	14	14,132	-62.1		30	13,959	-63.4		27	13,535	-54.8		28	13,660	-56.2		22	13,545	-55.4		28	13,772	-60.2		30	13,672	-57.7	
125---	13	15,261	-64.4		29	15,088	-60.8		26	14,688	-57.0		27	14,809	-59.5	48	31	14,740	-60.3	53	31	15,011	-63.4		30	14,840	-62.0	
100---	12	16,561	-71.4		28	16,371	-73.9		22	16,083	-60.8		25	16,194	-63.5		21	16,088	-60.5		20	16,286	-66.2		30	16,207	-65.9	
80---	9	17,867																										

# RADIOSONDE DATA

Average monthly values

Table 20—Continued

JANUARY 1953

SAN JUAN, P. R. (1016 MB.)				SANTA MARIA, CALIF. (1013 MB.)				S. STE. MARIE, MICH. ( 987 MB.)				SPOKANE, WASH. ( 929 MB.)				SWAN ISLAND, W. I. (1016 MB.)				TACUBAYA, MEXICO ( 774 MB.)				TAMPA, FLA. (1019 MB.)								
Standard pressure surface (mb.)	Number of observations				Dynamic height				Temperature				Relative humidity				Number of observations				Dynamic height				Temperature				Relative humidity			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity				
SURFACE	31	19	23.1	80	31	71	12.6	76	30	221	- 6.8	82	30	722	3.0	89	31	10	24.1	78	19	2,306	14.7	38	31	9	15.3	78				
1,000---	31	159	22.7	77	31	183	13.4	69	30	113	- 6.9	78	30	114	- 6.9	78	31	147	23.7	76	19	71	- 6.9	78	31	169	16.2	71				
950---	31	605	19.6	79	31	618	13.6	55	30	519	- 8.0	77	30	541	- 8.0	77	31	596	20.5	78	19	528	- 8.0	78	31	608	13.9	68				
900---	31	1,068	16.2	80	31	1,070	12.5	44	30	936	- 8.6	73	30	976	- 8.6	73	31	1,060	17.3	77	19	1,005	- 8.6	78	31	1,059	11.7	62				
850---	31	1,553	13.3	79	31	1,548	10.5	38	30	1,379	- 8.6	73	30	1,437	- 8.6	73	31	1,546	14.3	74	19	1,475	- 8.6	78	31	1,535	9.5	56				
800---	31	2,062	11.8	63	31	2,050	8.1	32	30	1,849	- 10.3	62	30	1,922	- 10.3	62	31	2,056	12.1	64	19	2,018	- 10.3	78	31	2,036	7.3	51				
750---	31	2,608	10.0	49	31	2,584	5.0	32	30	2,353	- 12.6	58	30	2,438	- 12.6	58	31	2,602	10.1	52	19	2,570	14.0	78	31	2,573	5.4	39				
700---	31	3,172	7.7	33	31	3,139	1.4	31	30	2,877	- 15.5	55	30	2,973	- 15.5	55	31	3,166	7.0	45	19	3,145	9.7	78	31	3,127	3.1					
650---	31	3,790	5.0		31	3,735	- 1.9	31	30	3,446	- 11.3	65	30	3,554	- 11.3	65	31	3,777	3.8	39	19	3,764	4.9	78	31	3,730	- 1.9					
600---	31	4,428	1.4		31	4,363	- 5.9	29	30	4,040	- 15.1	63	31	4,155	- 15.1	63	31	4,418	- 1.4	34	19	4,403	- 1.4	78	31	4,359	- 5.9					
550---	31	5,129	- 2.1		31	5,038	-10.6	32	30	4,689	- 19.3	61	31	4,811	- 19.3	61	31	5,113	- 2.1		19	5,097	- 2.1	78	31	5,045	- 10.6					
500---	31	5,874	- 7.0		31	5,765	-15.9	33	30	5,377	- 24.0	61	31	5,509	- 24.0	61	31	5,858	- 7.0		19	5,838	- 7.0	78	30	5,773	-15.9					
450---	31	6,700	-12.5		31	6,554	-21.5	34	30	6,133	- 29.6	62	31	6,273	- 29.6	62	31	6,676	-12.5		19	6,656	-12.5	78	30	6,576	-21.5					
400---	31	7,576	-19.0		31	7,408	-28.2	36	30	6,948	- 35.9	59	31	7,099	- 35.9	59	31	7,555	-19.0		19	7,531	-19.0	78	30	7,429	-28.2					
350---	31	8,556	-26.2		31	8,350	-35.8		30	7,851	- 42.7		30	8,012	- 42.7		31	8,532	-26.2		18	8,504	-26.2	78	30	8,380	-35.8					
300---	31	9,653	-34.5		31	9,403	-43.9		30	8,865	- 49.6		30	9,035	- 49.6		31	9,624	-34.5		17	9,591	-34.5	78	30	9,446	-43.9					
250---	31	10,903	-43.8		31	10,601	-52.9		29	10,037	- 54.2		29	10,207	- 54.2		31	10,867	-43.8		16	10,830	-43.8	78	30	10,666	-52.9					
200---	30	12,370	-54.4		31	12,018	-58.6		29	11,475	- 57.3		28	11,614	- 57.3		31	12,331	-54.4		13	12,286	-54.4	78	30	12,117	-58.6					
175---	30	13,214	-60.1		31	12,854	-59.3		29	12,343	- 54.9		25	12,460	- 54.9		31	13,182	-60.1		11	13,131	-60.1	78	29	12,978	-59.3					
150---	29	14,160	-66.1		30	13,818	-61.0		29	13,343	- 55.2		23	13,433	- 55.2		31	14,140	-66.1		9	14,088	-66.1	78	29	13,947	-61.0					
125---	28	15,249	-72.2		27	14,944	-64.3		28	14,531	- 55.7		20	14,578	- 55.7		30	15,239	-72.2		7	15,201	-72.2	78	29	15,067	-64.3					
100---	27	16,542	-78.2		24	16,282	-67.9		26	15,943	- 57.0		17	15,993	- 57.0		28	16,535	-78.2		6	16,513	-78.2	78	29	16,402	-67.9					
80---	21	17,806	-79.7		15	17,615	-68.8		26	17,352	- 56.1		12	17,394	- 56.1		27	17,810	-79.7					78	24	17,718	-68.8					
60---	18	19,455	-72.8		10	19,336	-68.1		21	19,159	- 56.9		9	19,202	- 56.9		15	19,466	-72.8					78	21	19,412	-72.8					
50---	16	20,540	-67.6		7	20,447	-65.4		15	20,309	- 57.1		8	20,357	- 57.1		12	20,547	-67.6					78	19	20,503	-67.6					
40---	9	21,898	-62.2		6	21,822	-63.6		9	21,717	- 58.9						10	21,917	-62.2					78	17	21,862	-62.2					
30---	7	23,695	-57.7														9	23,722	-57.7					78	10	23,650	-57.7					

TATOOSH ISLAND, WASH. (1005 MB.)				VERACRUZ, MEXICO (1016 MB.)				WASHINGTON, D. C. (1006 MB.)								
Standard pressure surface (mb.)	Number of observations				Dynamic height				Temperature				Relative humidity			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity				
SURFACE	31	31	7.7	89	27	13	22.4	74	31	88	3.1	77				
1,000---	31	69	7.1	85	27	147	21.4	74	31	136	3.6	70				
950---	31	494	5.4	85	27	589	18.6	72	31	556	3.4	70				
900---	31	931	2.9	85	27	1,053	16.5	59	31	992	2.8	68				
850---	31	1,391	- 2.2	86	27	1,538	14.1	52	31	1,453	1.1	66				
800---	31	1,875	- 2.6	83	27	2,047	11.7	50	31	1,940	- .8	64				
750---	31	2,388	- 5.6	76	27	2,590	9.3	41	31	2,459	- 3.0	60				
700---	31	2,922	- 8.7	69	26	3,155	6.8	36	31	2,997	- 5.8	61				
650---	31	3,498	-12.5	65	26	3,765	4.0	30	31	3,581	- 9.0	60				
600---	31	4,100	-16.1	59	25	4,409	- .3		31	4,190	-12.7	56				
550---	31	4,750	-20.5	55	24	5,100	- 3.8		31	4,850	-17.0	54				
500---	31	5,447	-25.6	53	23	5,849	- 8.8		30	5,551	-22.3	51				
450---	31	6,203	-31.5	52	23	6,660	-14.5		30	6,321	-27.9	48				
400---	31	7,025	-37.4	48	23	7,540	-20.7		30	7,152	-34.1	49				
350---	30	7,939	-43.6		22	8,514	-27.8		30	8,074	-40.4					
300---	30	8,958	-50.0		22	9,603	-36.6		30	9,109	-46.8					
250---	28	10,135	-55.2		21	10,840	-46.4		30	10,301	-52.3					
200---	25	11,552	-57.0		18	12,292	-56.0		27	11,738	-53.6					
175---	24	12,389	-55.4		17	13,133	-60.6		27	12,595	-54.2					
150---	23	13,369	-54.4		13	14,078	-65.0		26	13,579	-55.6					
125---	18	14,539	-55.0		12	15,176	-69.8		23	14,729	-58.7					
100---	15	15,969	-57.1		10	16,483	-75.0		21	16,106	-61.5					
80---	11	17,386	-57.8		9	17,757	-76.4		15	17,478	-63.5					
60---	5	19,202	-56.2						13	19,236	-64.0					
50---									9	20,359	-63.3					
40---									7	21,736	-61.4					
30---									6	23,531	-58.5					

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface, or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and

expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.



## Average monthly resultant winds

JANUARY 1953

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°; W = 270°); speeds in meters per second.

# RAWIN DATA Average monthly resultant winds

JANUARY 1953

Table 22

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			Int. Falls, Minn. (358 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed				
Surface-----	31	342	2.4	31	181	2.5	31	3	1.2	31	131	1.7	31	282	1.1	31	279	1.7	31	226	1.9	31	313	0.8	31	22	0.9	31	278	1.1	30	239	3.0	31	221	0.6
500-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,500-----	---	---	---	31	278	8.3	29	296	8.2	31	277	3.7	30	244	6.8	31	255	7.5	28	251	9.2	30	289	7.3	31	14	8	30	256	8.9	27	264	10.2	31	291	6.8
2,000-----	31	321	7.1	31	287	10.0	29	299	10.7	31	285	5.9	27	251	7.5	31	259	9.4	28	254	10.8	30	289	9.5	31	243	1.1	29	258	8.9	24	262	10.2	31	291	8.7
2,500-----	31	311	9.6	31	292	10.4	29	299	12.5	31	292	7.4	25	252	7.8	31	257	10.9	27	261	11.7	30	295	10.7	31	246	3.3	27	262	11.1	24	260	12.1	31	289	10.6
3,000-----	31	305	11.0	31	292	11.2	29	297	14.1	31	290	8.3	25	259	8.7	31	256	12.9	27	265	14.0	30	293	11.2	31	270	6.4	26	258	11.9	24	259	13.3	31	289	12.3
4,000-----	31	310	13.6	30	293	12.7	28	300	17.9	30	282	9.1	24	273	10.0	28	258	14.9	22	258	14.9	29	288	13.0	31	305	11.1	26	262	14.4	17	259	16.9	30	297	15.4
5,000-----	30	311	15.3	25	287	15.8	24	299	19.8	29	278	11.3	23	275	13.1	28	255	17.3	19	270	14.7	26	272	15.0	31	309	15.6	24	263	16.5	17	264	19.3	30	294	18.5
6,000-----	27	309	15.6	24	281	17.9	21	294	20.0	26	277	12.5	22	273	15.5	28	262	21.4	17	269	15.5	24	268	17.4	29	311	19.1	21	264	18.3	15	266	21.1	29	293	21.4
8,000-----	24	304	16.3	17	287	18.8	15	290	20.6	19	272	14.7	18	274	16.5	22	255	21.6	15	272	22.0	19	263	20.7	18	302	22.5	18	260	21.8	12	260	25.9	26	288	23.4
10,000-----	15	297	18.1	13	286	20.9	12	282	26.8	16	273	20.7	14	272	21.9	16	255	25.5	12	275	25.0	13	260	23.9	10	307	19.3	10	261	24.6				19	275	23.0
12,000-----	12	294	19.2							12	272	25.4	11	269	20.3	13	259	20.5	10	271	29.0													10	282	23.1
14,000-----										10			10	269	17.0	10	258	18.5																		

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P.R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)					
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations					
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed				
Surface-----	31	295	1.2	31	191	0.9	31	101	1.1	29	314	1.3	31	237	1.5	31	177	0.7	31	260	0.5	31	327	2.8	31	343	0.4	31	102	3.5	31	309	0.5	31	340	1.5			
500-----	31	243	4.0	31	189	1.4	31	154	2.1	27	269	5.0	29	223	6.0	30	258	1.6	29	282	1.4	---	---	---	31	232	2.0	31	93	8.4	31	277	8	30	31	3.6			
1,000-----	31	249	7.3	31	199	4.6	31	193	1.6	27	269	8.2	29	240	9.1	31	272	2.8	29	284	4.2	29	313	2.3	31	253	4.4	31	92	8.2	31	272	3.7	30	25	3.7			
1,500-----	30	263	8.6	31	221	8.3	31	234	2.8	27	259	10.8	30	256	9.5	31	263	4.3	27	276	7.5	29	299	9.2	31	273	5.9	31	88	7.8	31	286	6.2	30	346	4.1			
2,000-----	29	271	9.5	30	231	13.0	31	235	4.7	26	264	12.8	29	264	9.3	31	265	5.6	28	288	8.3	30	309	11.8	31	284	8.2	31	86	7.2	30	297	9.2	30	325	5.0			
2,500-----	27	281	10.4	28	242	15.6	31	241	5.6	27	258	15.2	29	270	11.0	31	273	7.4	27	282	9.0	30	305	12.8	31	288	9.7	31	86	5.6	30	300	11.5	30	311	5.8			
3,000-----	26	282	11.9	27	254	16.7	31	246	6.4	28	257	17.2	29	274	11.9	31	279	7.6	26	287	11.1	29	306	14.4	31	287	11.5	31	87	4.3	29	299	12.2	30	309	6.5			
4,000-----	20	284	13.7	26	264	17.9	29	249	8.3	26	260	18.9	30	275	14.3	31	278	11.8	25	273	12.7	28	299	16.0	29	287	13.0	31	100	2.4	29	297	15.4	28	291	7.7			
5,000-----	18	282	16.4	23	266	19.8	28	250	11.6	22	263	21.8	26	269	16.0	30	283	14.0	24	280	14.8	24	297	18.8	25	285	13.6	31	323	6.9	290	19.0	26	281	9.0				
6,000-----	12	281	13.6	14	275	20.1	26	255	12.2	15	254	21.4	22	266	13.7	27	281	17.4	21	267	17.8	21	299	18.9	24	280	15.1	31	255	2.3	26	293	20.9	24	279	9.6			
8,000-----							25	259	20.3	10	259	27.6	17	265	15.5	5	21	266	19.3	18	277	18.8	15	300	18.8	21	273	18.9	31	275	9.0	22	281	22.8	22	288	12.4		
10,000-----							22	260	25.2							13	266	20.4	14	283	18.5	11	280	22.0	18	278	24.2	31	279	21.1	16	272	24.0	21	278	14.1			
12,000-----							20	258	31.1							11	276	21.7	10	280	25.4	10	269	27.8	11	278	26.1				30	272	28.8	12	279	23.1	21	275	21.8
14,000-----							14	265	19.1																														
16,000-----							11	274	13.9																														
18,000-----																																							
20,000-----																																							

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D.C. (8 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed	
Surface-----	30	353	0.5	30	200	4.1	27	181	4.4	31	307	0.8
500-----	29	230	1.1	---	---	---	23	201	7.5	30	258	4.3
1,000-----	29	262	3.4	29	212	9.0	26	220	8.8	29	256	6.7
1,500-----	29	265	4.8	26	229	11.9	26	229	9.5	28	258	8.4
2,000-----	29	275	6.6	26	242	12.3	25	230	10.3	29	256	9.7
2,500-----	29	271	8.0	24	254	12.8	25	240	12.3	29	259	10.6
3,000-----	29	272	9.9	23	262	14.6	24	242	14.4	28	264	12.3
4,000-----	29	273	12.0	20	272	18.8	22	255	17.0	28	270	15.3
5,000-----	29	277	15.0	16	274	22.3	19	257	17.0	28	261	19.0
6,000-----	27	274	15.7	13	277	19.4	17	259	16.2	28	260	21.0
8,000-----	16	270	17.9	11	283	23.4	13	264	18.7	29	257	28.6
10,000-----	10	254	15.8							30	259	34.3
12,000-----										25	261	35.2
14,000-----										21	258	28.9
16,000-----										19	262	24.1
18,000-----										13	256	14.9



# SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun.

JANUARY 1953

LINCOLN, NEBR.									
Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
Jan.	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
2-----	0.96	1.04	1.15	-----	-----	-----	-----	-----	-----
3-----	.98	1.09	1.22	-----	-----	-----	-----	-----	-----
24-----	.96	1.06	1.18	1.31	-----	1.31	-----	-----	-----
26-----	.76	.87	1.02	1.20	-----	1.20	1.07	0.96	0.88
28-----	.83	.98	1.15	1.31	-----	1.31	-----	-----	-----
31-----	.83	.94	-----	-----	-----	-----	-----	-----	-----
Aver- ages Depar- tures	.89	1.00	1.14	1.27	-----	1.27	1.07	.96	.88
	-.03	-.04	-.04	-.11	-----	-.10	-.11	-.09	-.05
MADISON, WIS.									
Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
Jan.	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
5-----	0.94	1.06	1.19	-----	-----	-----	-----	-----	-----
13-----	.71	.81	.99	-----	-----	-----	-----	-----	-----
Aver- ages Depar- tures	.83	.94	1.09	-----	-----	-----	-----	-----	-----
	-.05	-.07	-.08	-----	-----	-----	-----	-----	-----
TABLE MOUNTAIN, CALIF.									
Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
Jan.	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
9-----	-----	-----	1.35	1.49	-----	-----	-----	-----	-----
10-----	-----	-----	1.37	1.51	-----	-----	-----	-----	-----
12-----	-----	-----	-----	1.50	-----	-----	-----	-----	-----
15-----	-----	-----	1.37	1.55	-----	-----	-----	-----	-----
19-----	-----	-----	1.32	1.47	-----	-----	-----	-----	-----
21-----	-----	-----	1.37	1.57	-----	-----	-----	-----	-----
23-----	-----	-----	1.42	1.52	-----	-----	-----	-----	-----
27-----	-----	-----	1.43	1.59	-----	-----	-----	-----	-----
29-----	-----	-----	1.40	1.52	-----	-----	-----	-----	-----
30-----	-----	-----	-----	1.55	-----	-----	-----	-----	-----
31-----	-----	-----	1.41	1.54	-----	-----	-----	-----	-----
Aver- ages Depar- tures	-----	-----	1.38	1.53	-----	-----	-----	-----	-----
	-----	-----	-.01	-.02	-----	-----	-----	-----	-----
BOSTON, MASS.									
Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
Jan.	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
5-----	-----	1.10	1.11	-----	-----	-----	-----	-----	-----
14-----	-----	.76	.77	-----	-----	-----	0.75	-----	-----
26-----	1.10	-----	-----	-----	-----	-----	1.27	1.18	1.08
29-----	-----	-----	1.16	-----	-----	-----	1.11	-----	-----
Aver- ages Depar- tures	1.10	.93	1.01	-----	-----	-----	1.04	1.18	1.08
	+.30	+.06	+.01	-----	-----	-----	+.01	+.25	+.26
BLUE HILL, MASS.									
Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
Jan.	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
1-----	0.96	1.07	1.27	-----	-----	-----	1.31	1.19	1.07
4-----	.73	-----	-----	-----	-----	-----	-----	-----	-----
17-----	1.05	1.12	1.18	-----	-----	-----	1.19	1.11	.97
19-----	.76	-----	-----	-----	-----	-----	-----	-----	-----
26-----	-----	-----	1.11	-----	-----	-----	1.31	1.21	1.13
29-----	.94	1.07	1.20	-----	-----	-----	-----	-----	-----
Aver- ages Depar- tures	.88	1.09	1.19	-----	-----	-----	1.27	1.17	1.06
	-.05	+.05	+.04	-----	-----	-----	+.10	+.13	+.13
RATIO BOSTON/BLUE HILL ON COMPARABLE DATES									
	-----	-----	0.97	-----	-----	-----	0.97	0.98	0.96
ALBUQUERQUE, N. MEX.									
Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
Jan.	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08
9-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
10-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
12-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
15-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
19-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
21-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
23-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
27-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
29-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
30-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
31-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Aver- ages Depar- tures	-----	-----	-----	-----	-----	-----	-----	-----	-----
	-----	-----	-----	-----	-----	-----	-----	-----	-----
NO DATA DURING JANUARY 1953									
	-----	-----	-----	-----	-----	-----	-----	-----	-----
	-----	-----	-----	-----	-----	-----	-----	-----	-----

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of

pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

\* Extrapolated

# SOLAR RADIATION DATA

JANUARY 1953

**Table 31a** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

								Avg									Avg								Avg
Date-----	1	2	3	4	5	6	7		8	9	10	11	12	13	14			15	16	17	18	19	20	21	
Langleys-----	80	55	7	44	35	36	51	44	44	13	13	34	42	35	45	32		47	44	39	25	43	16	23	34
Date-----	22	23	24	25	26	27	28		29	30	31	1	2	3	4										
Langleys-----	76	68	12	31	45	41	4	40	45	49	39	50	56	26	32	43									

**Table 31b** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

								Avg									Avg								Avg
Date-----	1	2	3	4	5	6	7		8	9	10	11	12	13	14			15	16	17	18	19	20	21	
Langleys-----	112	113	14	146	178	64	49	97	52	10	20	42	45	40	210	60		196	110	177	24	151	18	38	102
Date-----	22	23	24	25	26	27	28		29	30	31	1	2	3	4										
Langleys-----	129	155	8	20	147	70	4	76	189	217	43	63	213	20	41	112									

**Table 31c** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

								Avg									Avg								Avg
Date-----	1	2	3	4	5	6	7		8	9	10	11	12	13	14			15	16	17	18	19	20	21	
Langleys-----	524	219	36	359	457	148	156	271	135	10	19	44	102	30	393	105		430	151	524	71	295	17	42	219
Date-----	22	23	24	25	26	27	28		29	30	31	1	2	3	4										
Langleys-----	283	298	10	52	543	95	5	184	514	446	255	371	328	23	42	283									

**Table 31d** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

								Avg									Avg								Avg
Date-----	1	2	3	4	5	6	7		8	9	10	11	12	13	14			15	16	17	18	19	20	21	
Langleys-----	173	63	14	117	130	84	95	97	67	9	21	47	145	47	120	65		178	60	174	73	58	18	27	84
Date-----	22	23	24	25	26	27	28		29	30	31	1	2	3	4										
Langleys-----	132	74	9	35	206	46	5	72	155	118	125	192	74	26	29	103									

**Table 31e** Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

								Avg									Avg								Avg
Date-----	1	2	3	4	5	6	7		8	9	10	11	12	13	14			15	16	17	18	19	20	21	
Langleys-----	32	75	18	59	56	66	67	54	83	15	21	42	67	53	58	48		73	68	48	69	71	43	52	61
Date-----	22	23	24	25	26	27	28		29	30	31	1	2	3	4										
Langleys-----	104	72	13	55	73	89	7	59	40	67	63	50	64	37	51	53									

Note: Langley is the unit used to denote one gram calorie per square centimeter.



Table 33 — Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in landings.

Table 33 — Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in landings.

[illegible]

Accumulated Departures January 1 to February 4, 1953

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

\* This station replacing North Head, Washington, for Solar Radiation observations from January 22, 1953.

# SOLAR RADIATION DATA

Table 33--Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleya, - Continued

JANUARY 1953

	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison, Wis.	Medford, Ore.	Miami, Fla.	Nashville, Tenn.	Newport, R.I.	New York, N.Y.	* North Head, Wash.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Rapid City, S. Dak.	Riverside, Calif.	Salt Lake City, Utah	San Antonio, Tex.	Santa Maria, Calif.	Sault Ste. Marie, Mich.	Saville, N.Y.	Schenectady, N.Y.	Seabrook, N.J.	Seattle, Wash. (U. of W.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Is., B.W.I.	Tampa, Fla.	Toronto, Ontario	Upton, N.Y.	Washington, D.C. (Amer. U.)	Winnipeg, Manitoba		
1953																																			
January 1-----	273	--	272	70	42	446	211	253	203	54	207	266	82	330	192	302	---	459	311	48	285	153	209	121	71	61	206	470	423	15	225	211	108		
January 2-----	335	343	292	64	102	218	54	67	68	41	6	345	31	334	191	302	70	370	260	44	117	70	165	12	11	109	269	332	357	10	116	172	55		
January 3-----	261	351	297	151	70	448	130	222	159	171	62	352	75	341	193	321	307	443	330	163	62	177	130	91	106	55	278	367	218	64	59	77	135		
January 4-----	266	329	284	224	65	414	186	208	78	153	71	356	207	355	136	330	207	432	339	163	244	177	139	74	63	109	292	445	425	130	211	84	135		
January 5-----	181	32	24	89	(124)	418	165	148	192	51	62	323	138	351	109	36	52	378	117	137	139	136	200	28	200	258	467	414	186	171	152	120	52		
January 6-----	172	138	65	121	38	437	188	153	166	64	91	275	214	204	185	171	41	329	74	151	148	167	160	40	29	144	170	436	390	184	128	---	52		
Averages-----	231	257	218	116	(71)	385	144	161	130	99	74	325	(134)	295	143	255	116	401	246	106	178	124	157	71	55	121	251	394	350	92	156	139	96		
Departures-----	---	---	---	-12	---	---	+33	+35	+16	---	---	---	---	---	---	+8	---	---	---	---	---	---	---	---	---	+19	---	---	---	---	---	---	-19	---	---
January 8-----	131	81	115	30	60	125	181	107	---	41	20	331	187	335	204	179	138	401	95	158	43	71	18	21	17	16	230	271	175	40	35	17	84		
January 9-----	308	346	298	86	137	159	26	16	---	67	20	387	96	344	161	322	115	431	312	100	27	39	26	23	52	37	304	469	173	21	18	21	66		
January 10-----	352	309	291	225	85	374	199	45	---	46	2	361	20	317	127	299	128	440	100	169	50	62	29	57	85	36	298	309	279	28	28	35	89		
January 11-----	333	46	86	114	65	426	305	55	---	---	269	275	215	326	127	89	108	427	203	44	127	198	249	48	51	254	434	458	206	109	272	59	---		
January 12-----	224	30	28	209	30	301	301	75	---	64	208	300	87	324	102	34	108	204	38	47	177	184	147	61	58	177	254	463	442	175	160	105	78		
January 13-----	118	372	288	51	163	428	168	206	---	99	136	356	105	366	59	286	100	378	282	48	214	149	180	38	70	203	192	284	345	65	202	200	89		
Averages-----	223	217	200	109	104	296	174	75	---	65	100	325	105	337	145	216	120	392	196	88	96	93	101	47	52	108	256	378	313	83	85	96	86		
Departures-----	---	---	---	-27	---	---	+39	-77	---	---	---	---	---	---	---	-30	---	---	---	---	---	---	---	---	---	-5	---	---	---	---	---	---	-55	---	---
January 15-----	116	365	311	82	163	325	12	136	---	---	79	297	32	341	245	353	319	246	350	10	189	126	218	43	24	205	295	468	436	57	167	229	179		
January 16-----	195	303	303	103	43	322	75	149	---	---	78	61	193	372	224	338	226	105	348	209	157	105	183	36	22	52	54	467	432	204	148	210	54	---	
January 17-----	192	302	261	59	22	436	39	264	---	---	---	19	409	198	350	197	292	148	466	301	119	289	199	210	24	24	133	363	475	396	75	238	108	69	
January 18-----	278	273	255	197	42	451	314	45	---	---	281	371	45	305	103	289	64	457	221	40	54	66	58	29	25	61	249	393	251	39	52	68	144	---	
January 19-----	197	110	108	137	38	352	310	199	---	---	235	188	46	354	66	307	69	448	351	142	184	80	186	40	42	94	255	405	364	48	---	176	192	---	
January 20-----	209	44	31	111	193	410	107	56	---	---	32	235	170	369	214	88	125	447	213	---	65	82	122	54	49	102	194	474	242	70	57	158	83	---	
January 21-----	115	366	298	104	152	398	49	45	---	---	186	367	116	372	99	363	185	449	362	107	34	62	20	47	46	37	328	472	370	80	32	15	77	---	
Averages-----	172	258	224	113	93	385	158	128	---	---	130	276	114	352	164	290	148	374	307	104	136	103	142	39	33	98	248	451	356	82	116	138	114	---	
Departures-----	---	---	---	-39	---	---	+6	-29	---	---	---	---	---	---	---	+15	---	---	---	---	---	---	---	---	---	---	-37	---	---	---	---	---	-19	---	---
January 22-----	133	345	310	40	217	340	268	222	---	---	243	60	191	387	249	358	252	432	358	48	282	156	214	11	19	119	30	446	443	130	250	196	199	---	
January 23-----	70	375	331	43	170	451	128	161	---	---	36	249	148	382	165	359	230	469	361	50	195	93	207	18	35	58	206	483	293	82	208	153	252	---	
January 24-----	388	292	254	82	(132)	255	34	29	---	---	19	377	26	382	237	322	209	555	291	110	233	38	80	40	108	358	291	328	49	---	209	115	---		
January 25-----	357	333	320	214	165	501	278	157	---	---	109	349	61	254	206	296	141	388	299	249	190	88	154	55	51	144	273	295	493	178	---	197	136	---	
January 26-----	353	307	285	204	175	445	273	293	---	---	190	381	271	226	260	264	175	466	370	230	322	230	302	69	75	291	343	414	470	263	284	303	42	---	
January 27-----	130	377	336	171	(164)	301	66	98	---	---	7	245	66	398	215	391	257	245	411	65	44	37	40	82	33	97	207	480	451	42	48	77	157	---	
January 28-----	372	418	355	216	90	348	305	28	---	---	279	400	136	402	219	361	140	477	393	111	35	58	43	31	26	100	363	495	360	226	27	121	127	---	
Averages-----	258	349	313	138	(159)	377	193	141	---	---	126	294	128	347	224	336	200	433	355	123	156	99	143	49	40	131	254	415	406	132	163	180	133	---	
Departures-----	---	---	---	-40	---	---	+28	-15	---	---	---	---	---	---	---	+74	---	---	---	---	---	---	---	---	---	---	-14	---	---	---	---	---	+4	---	---
January 29-----	369	396	332	222	54	383	301	277	---	---	312	384	205	407	172	377	268	449	389	186	199	145	215	43	37	107	344	505	268	246	205	166	128	---	
January 30-----	94	389	336	126	175	102	203	291	---	---	188	290	194	381	121	382	165	299	395	169	256	147	261	35	38	196	344	435	450	78	245	243	73	---	
January 31-----	154	398	346	165	97	310	81	162	---	---	247	416	95	420	128	390	284	121	396	103	178	108	204	54	42	161	326	486	454	35	168	258	228	---	
February 1-----	395	396	343	194	105	499	354	248	---	---	312	427	259	425	135	375	155	468	400	237	266	205	276	69	82	367	434	394	354	233	252	276	70	---	
February 2-----	408	365	342	174	65	184	352	283	---	---	177	335	188	417	142	402	212	485	417	151	310	174	258	78	77	---	322	497	108	62	273	207	200	---	
February 3-----	263	255	196	143	471	112	63	105	---	---	111	364	275	391																					

Accumulated Departures January 1 to February 4, 1953

Note:--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

\* Ceased Solar Radiation observations January 14, 1953 (see note for Astoria, Oregon).



## ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

JANUARY 1953

Station	Day of month																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
Baltimore, Md.-----	188	157	53	95	164	163	81	18	23	45	315	262	98	205	---	209	137	---	184	130	19	153	---	177	159	280	65	96	153	227	244	146

The foot-candle hr hr is the average illumination for one hour, in foot-candles. The foot-candle hours for a day are obtained simply by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continuous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in Illuminating Engineering, Vol. XLVI No. 2, pages 50<sup>a</sup> to 62.

The illuminometers are mounted on the south corner of the second floor roof of the airport terminal building at Friendship International Airport, which is about 8 1/2 miles south of the center of Baltimore. Station coordinates are latitude 39° 11' N., longitude 76° 40' W. The illuminometer is about 50 feet above the ground and located 200 feet above sea level. A source of considerable smoke is located along the Patapsco River estuary about 6 to 10 miles north to east of the station.

### CORRECTION

The Total Precipitation for Washington, D. C., as published in the MONTHLY WEATHER REVIEW for 1946, page 105, should read as 2.39.

NWRC, Asheville, N.C. -- 4/22/53 -- 2200



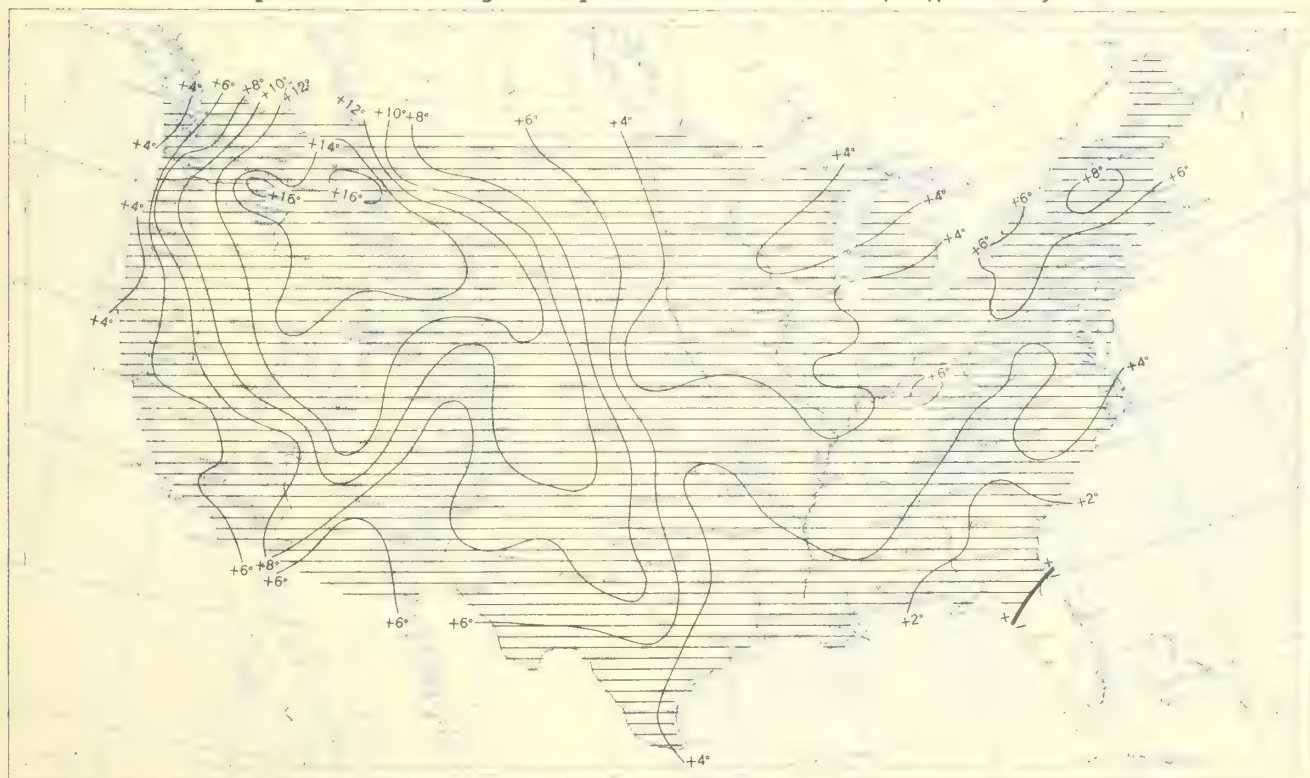




Chart I. A. Average Temperature ( $^{\circ}\text{F.}$ ) at Surface, January 1953.



B. Departure of Average Temperature from Normal ( $^{\circ}\text{F.}$ ), January 1953.

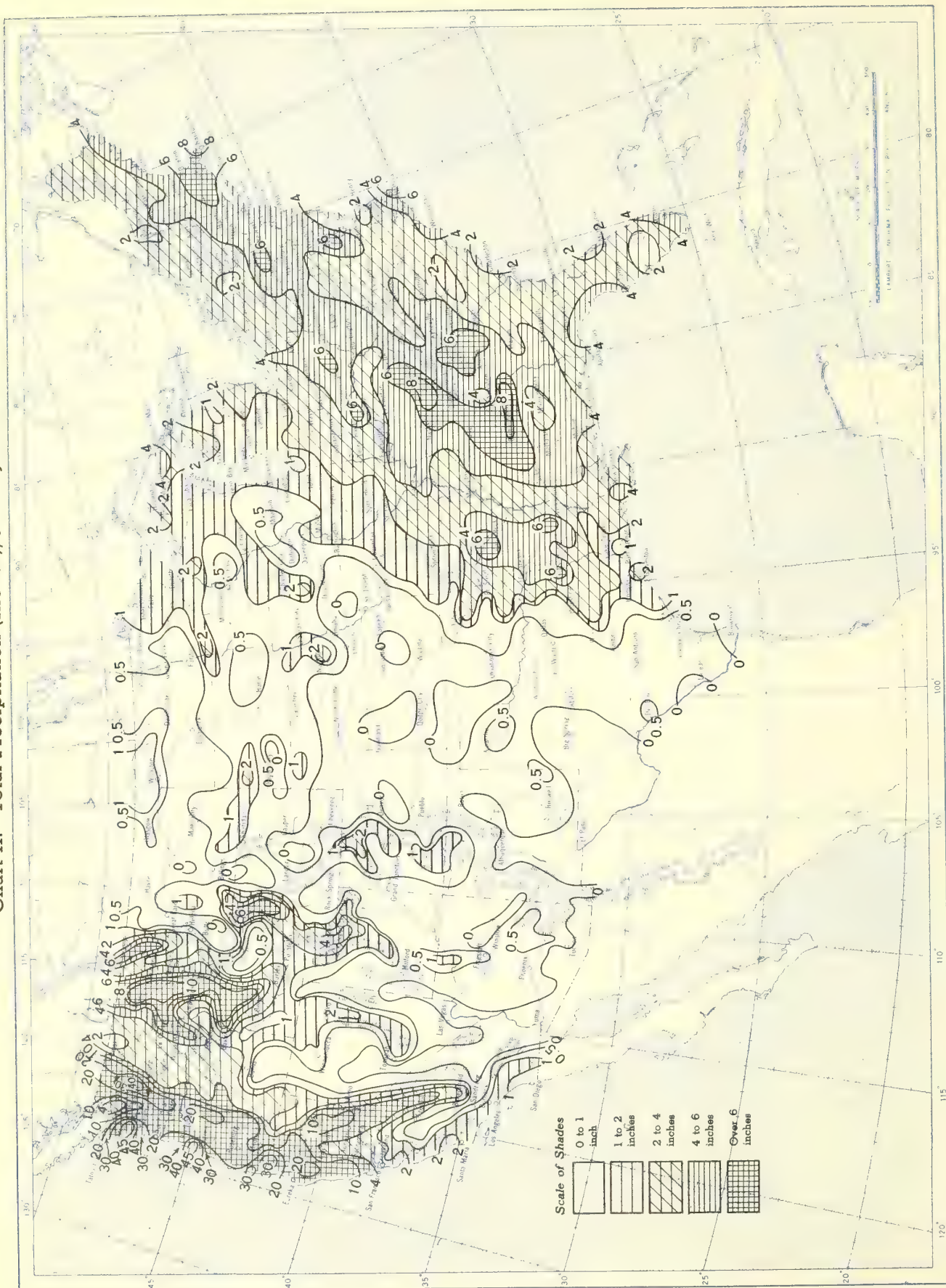


A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

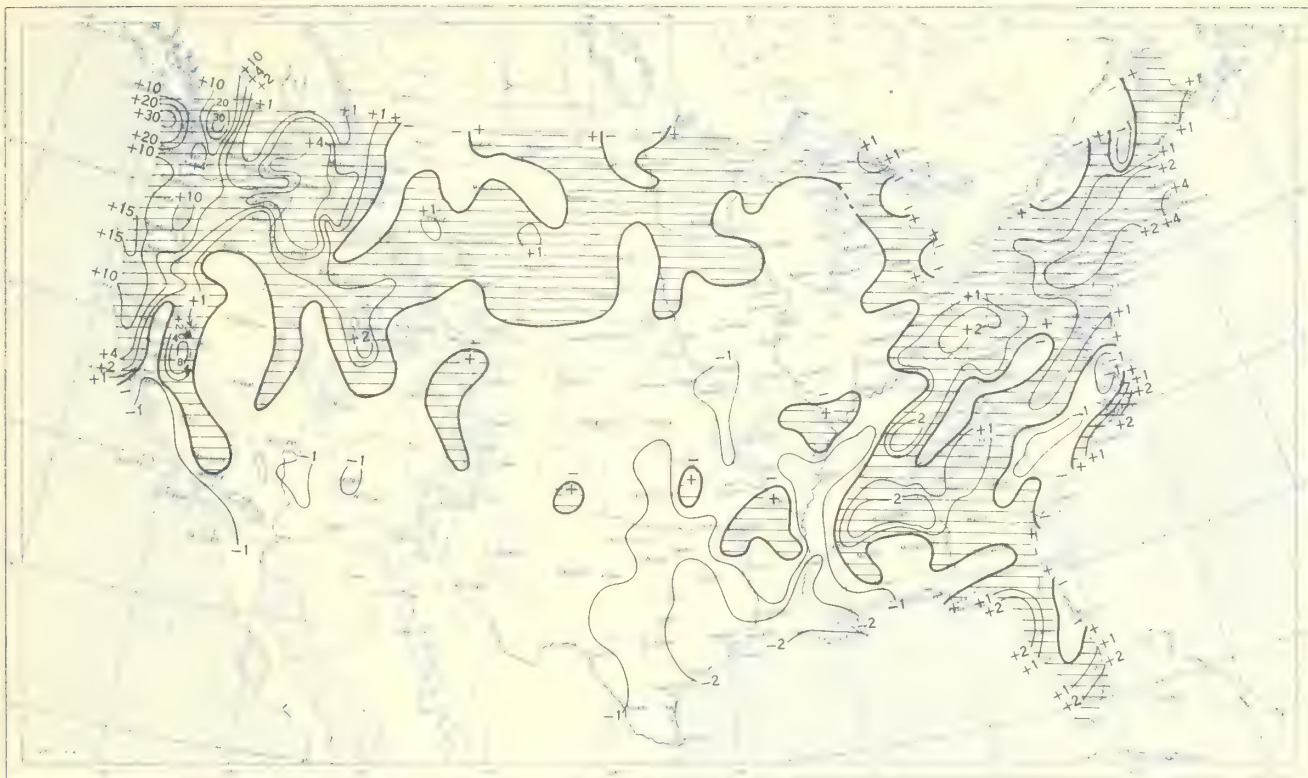


Chart II. Total Precipitation (Inches), January 1953.

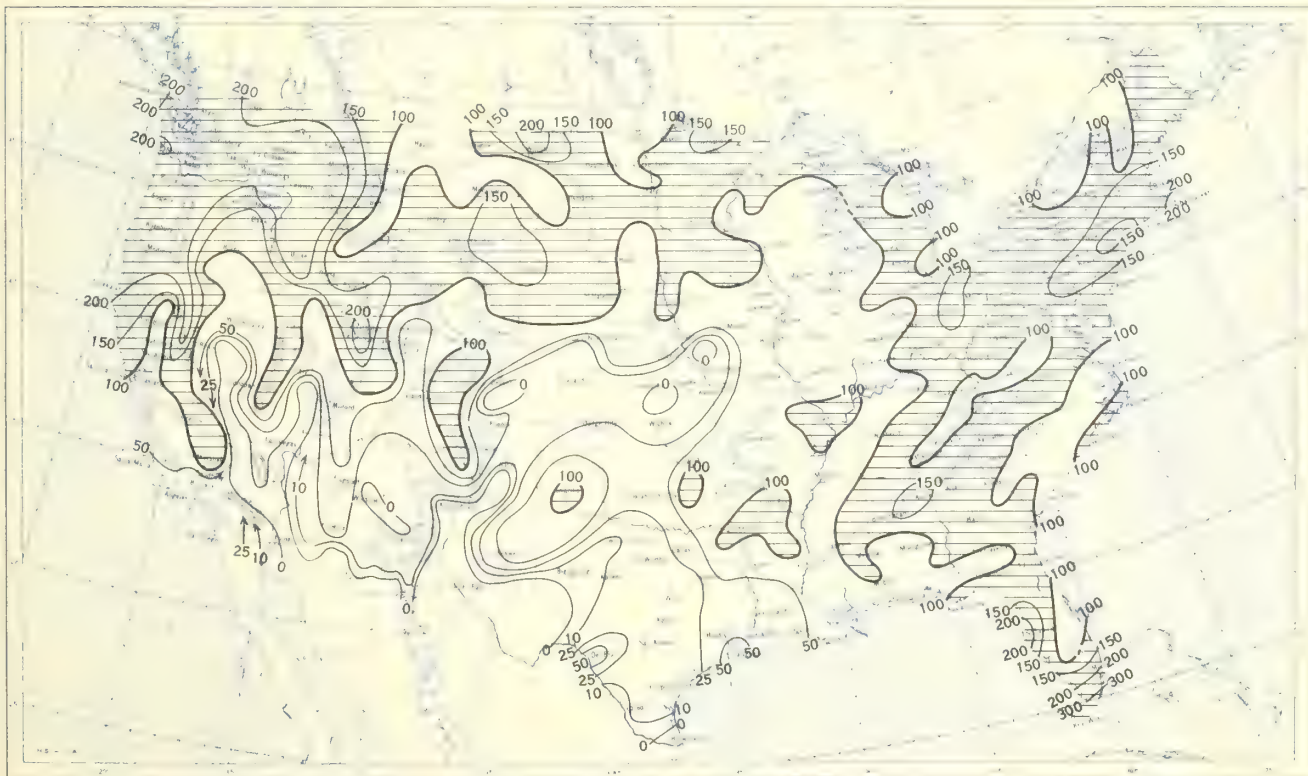


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), January 1953.



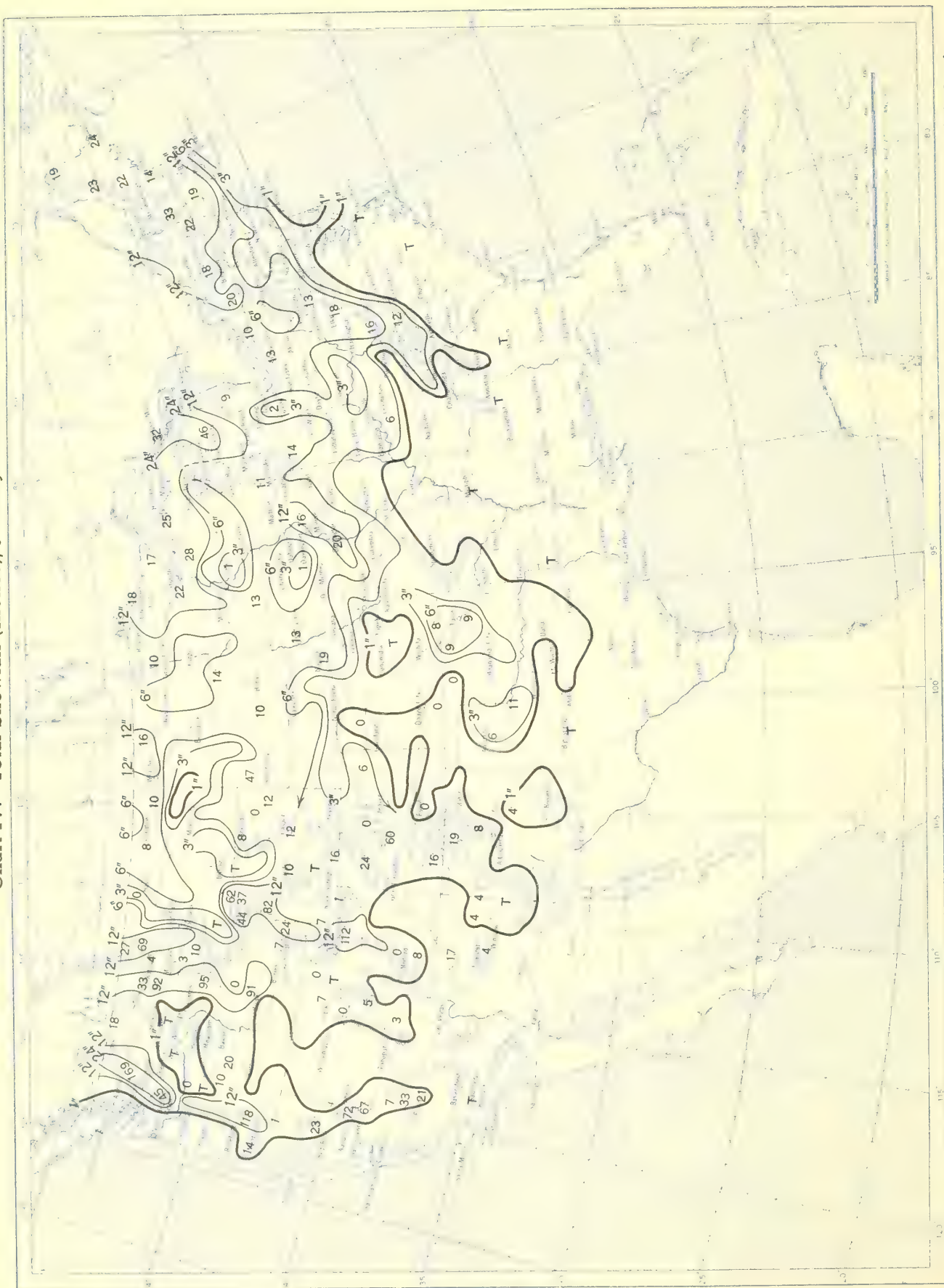
B. Percentage of Normal Precipitation, January 1953.



Normal monthly precipitation amounts are computed for stations having at least 10 years of record.



Chart IV. Total Snowfall (Inches), January 1953.

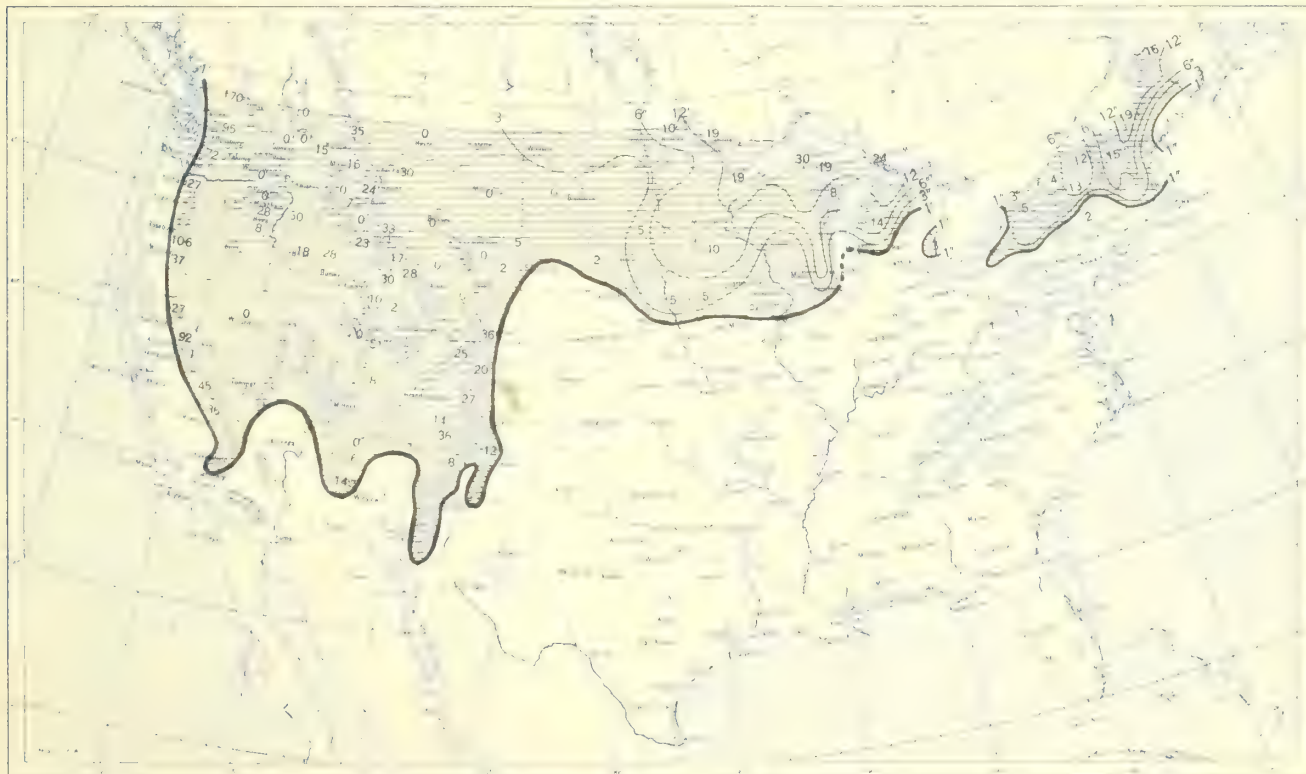


This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, January 1953.



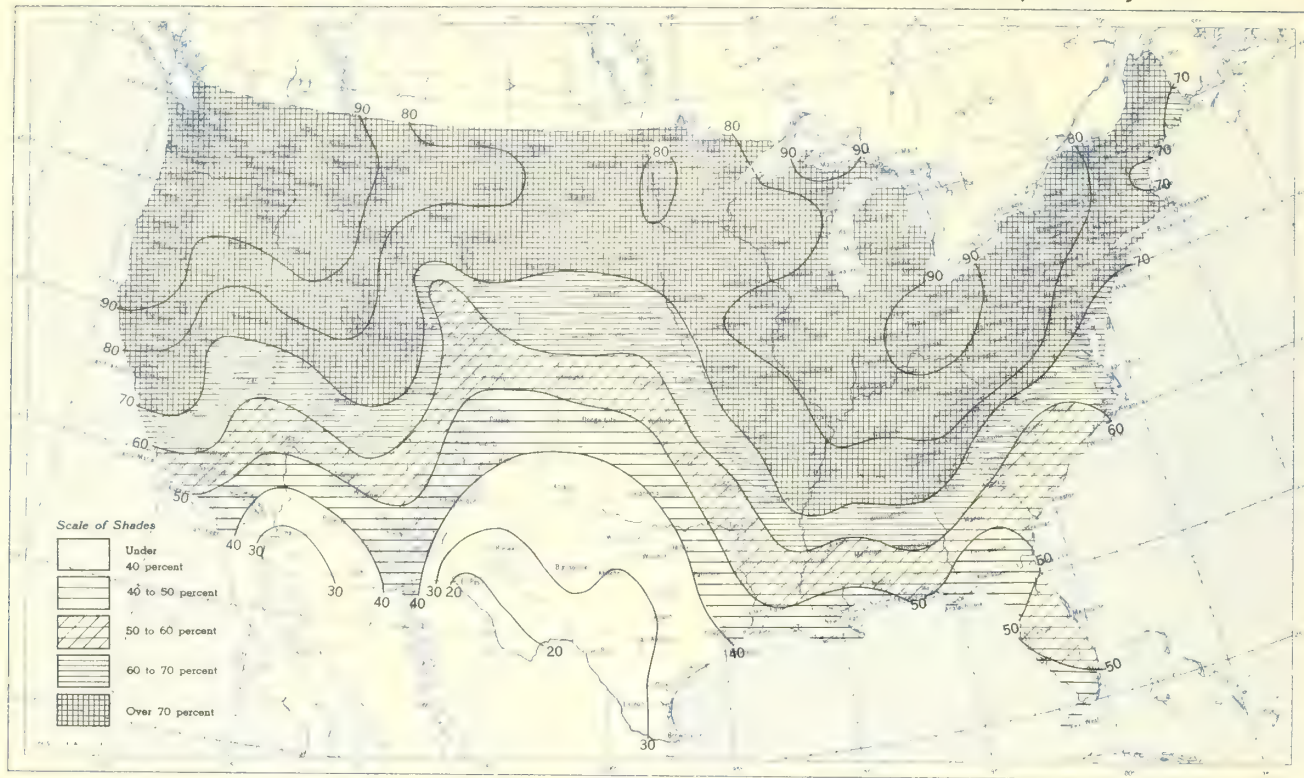
B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T., January 27, 1953.



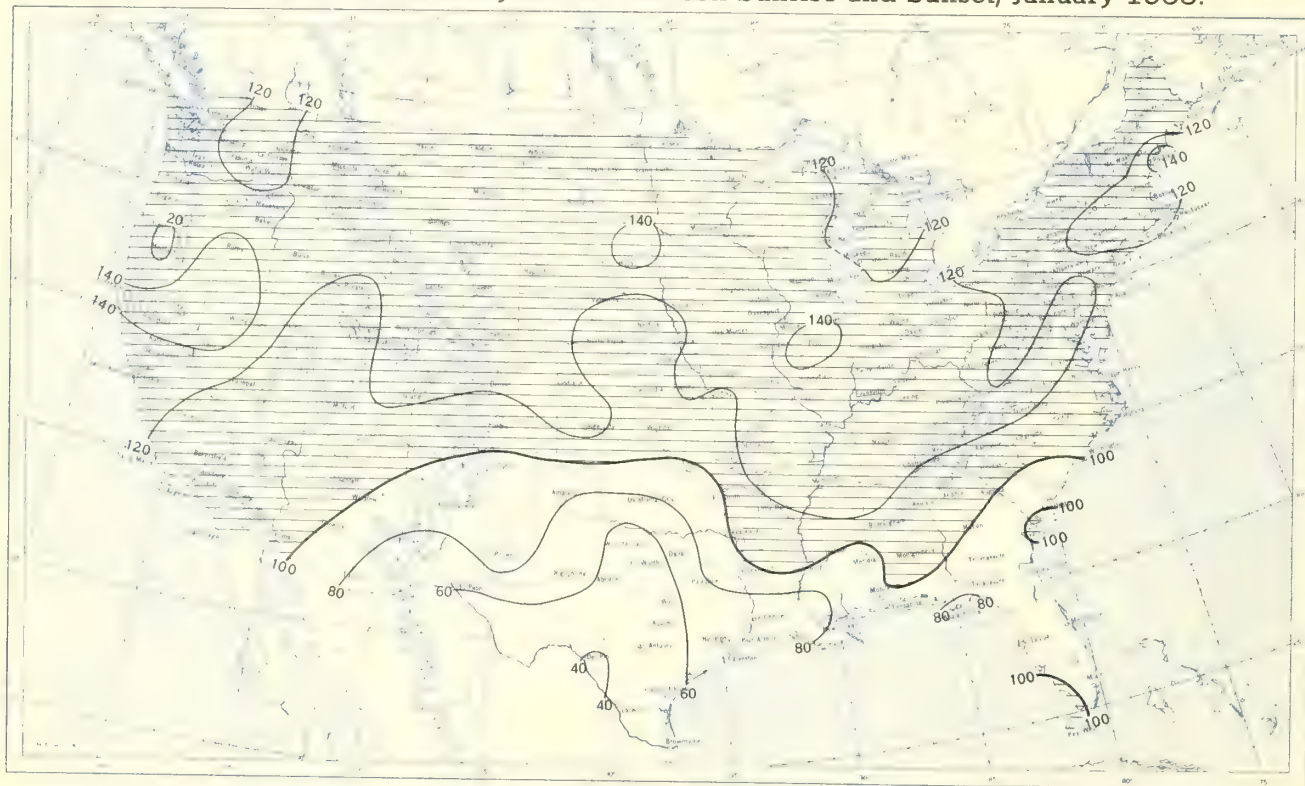
A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.  
 B. Shows depth currently on ground at 7:30 a. m. E. S. T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.



Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, January 1953.

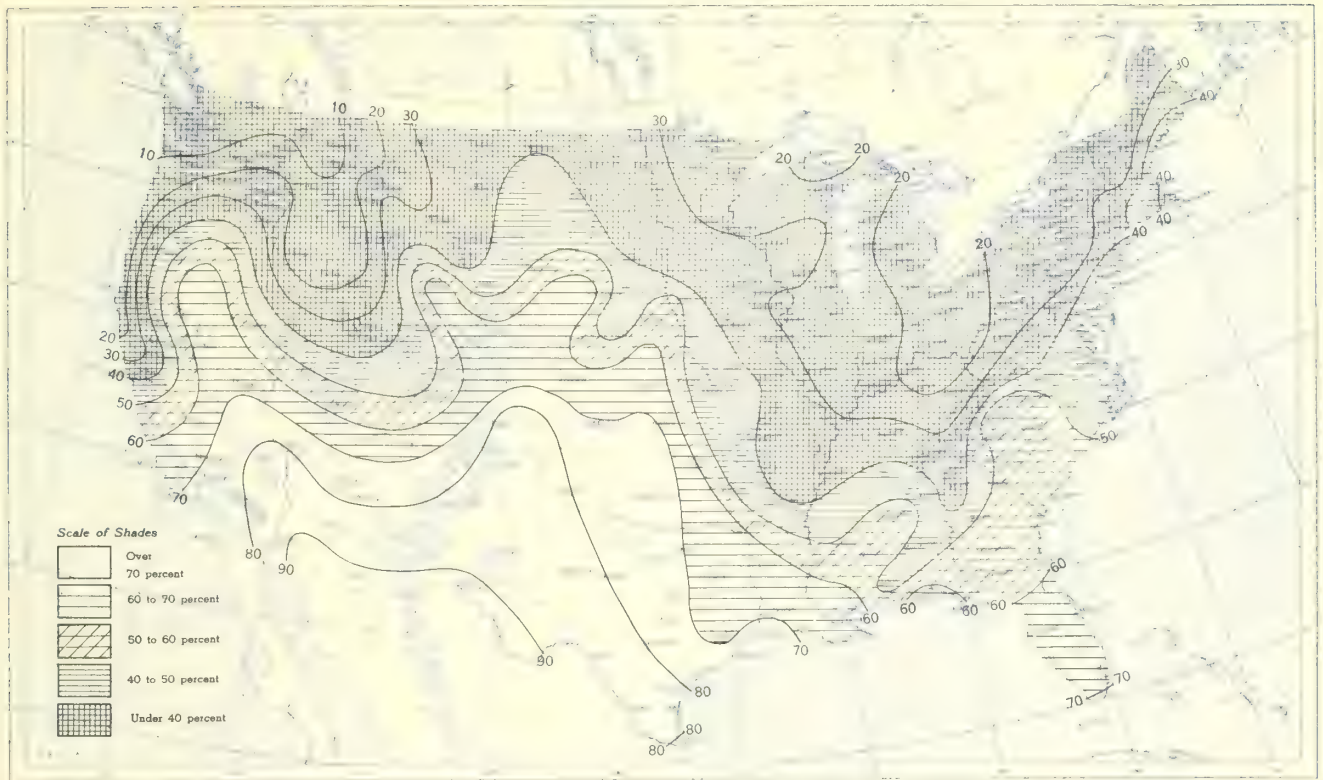


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, January 1953.

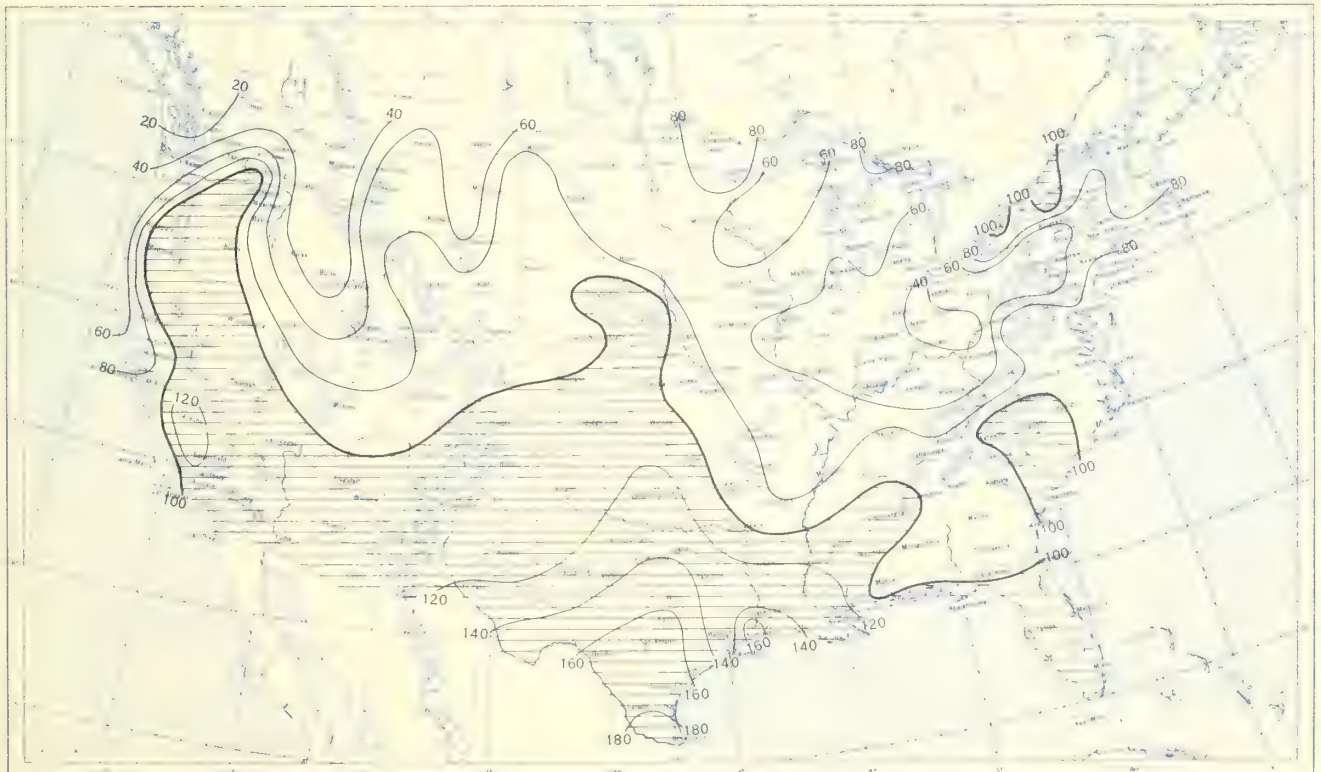


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, January 1953.



B. Percentage of Normal Sunshine, January 1953.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.



Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, January 1953. Inset: Percentage of Normal Average Daily Solar Radiation, January 1953.

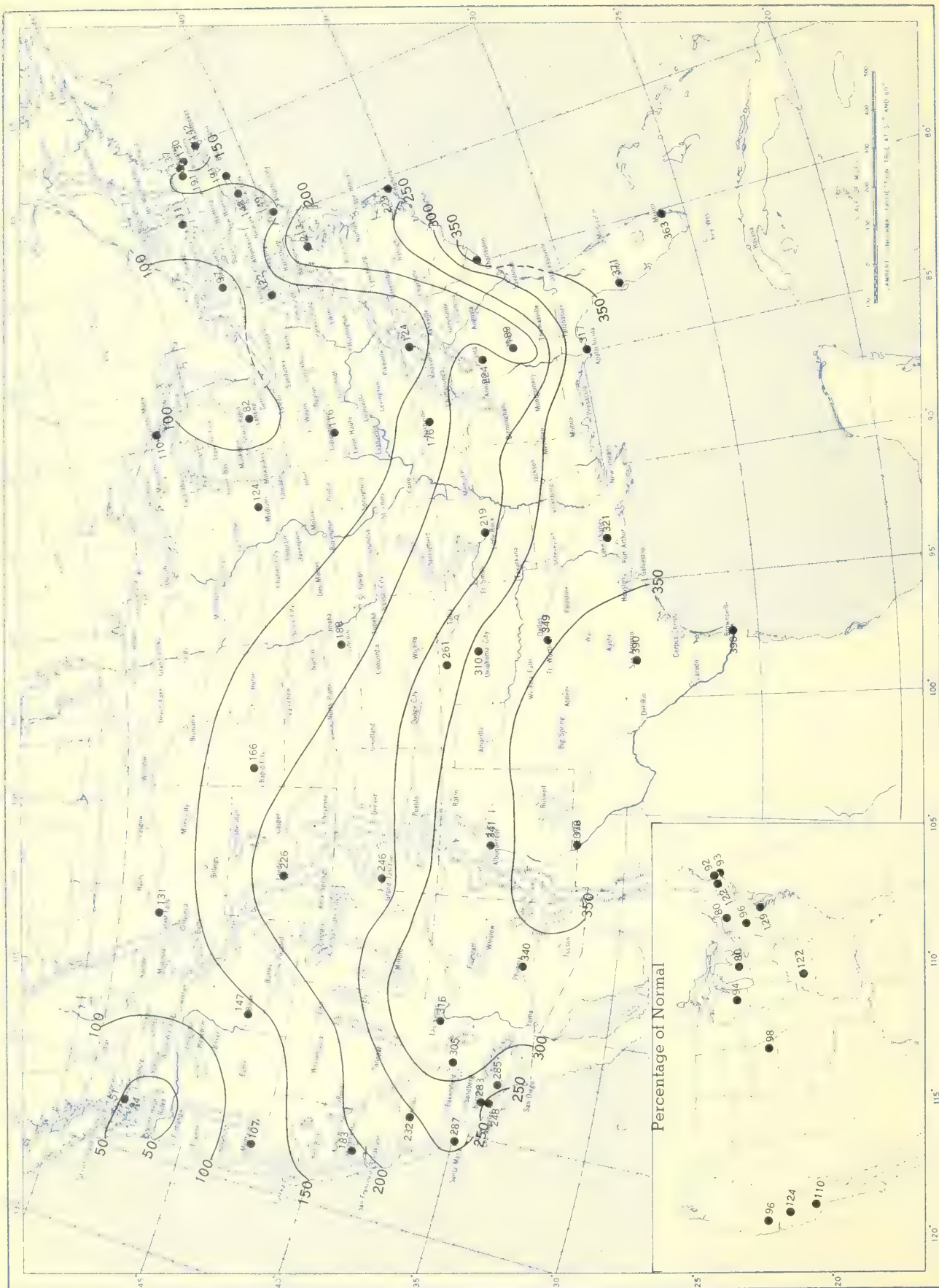
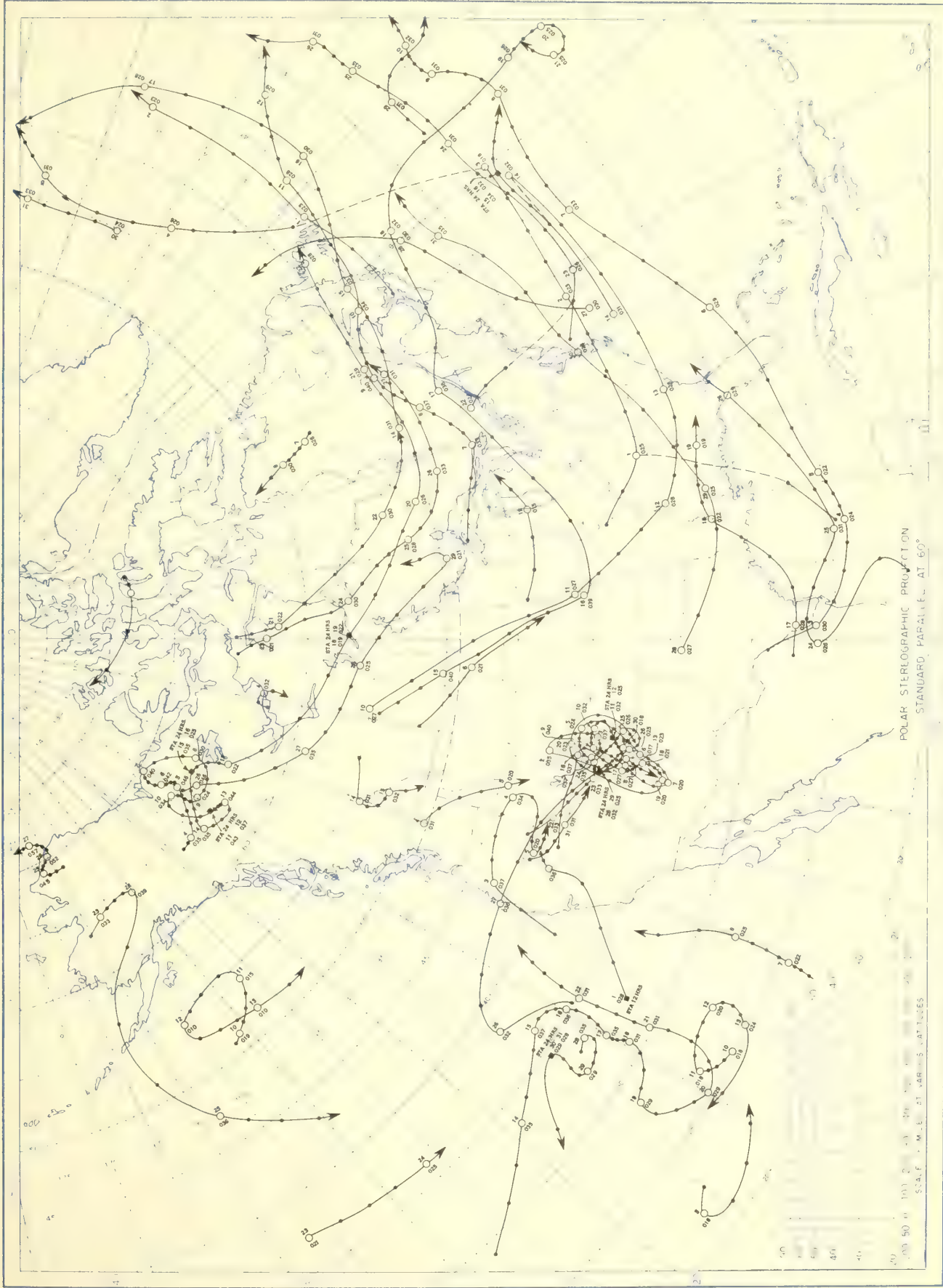


Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langley (1 langley = 1 gm. cal. cm. <sup>-2</sup>). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals

Chart IX. Tracks of Centers of Anticyclones at Sea Level, January 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.



Chart X. Tracks of Centers of Cyclones at Sea Level, January 1953.

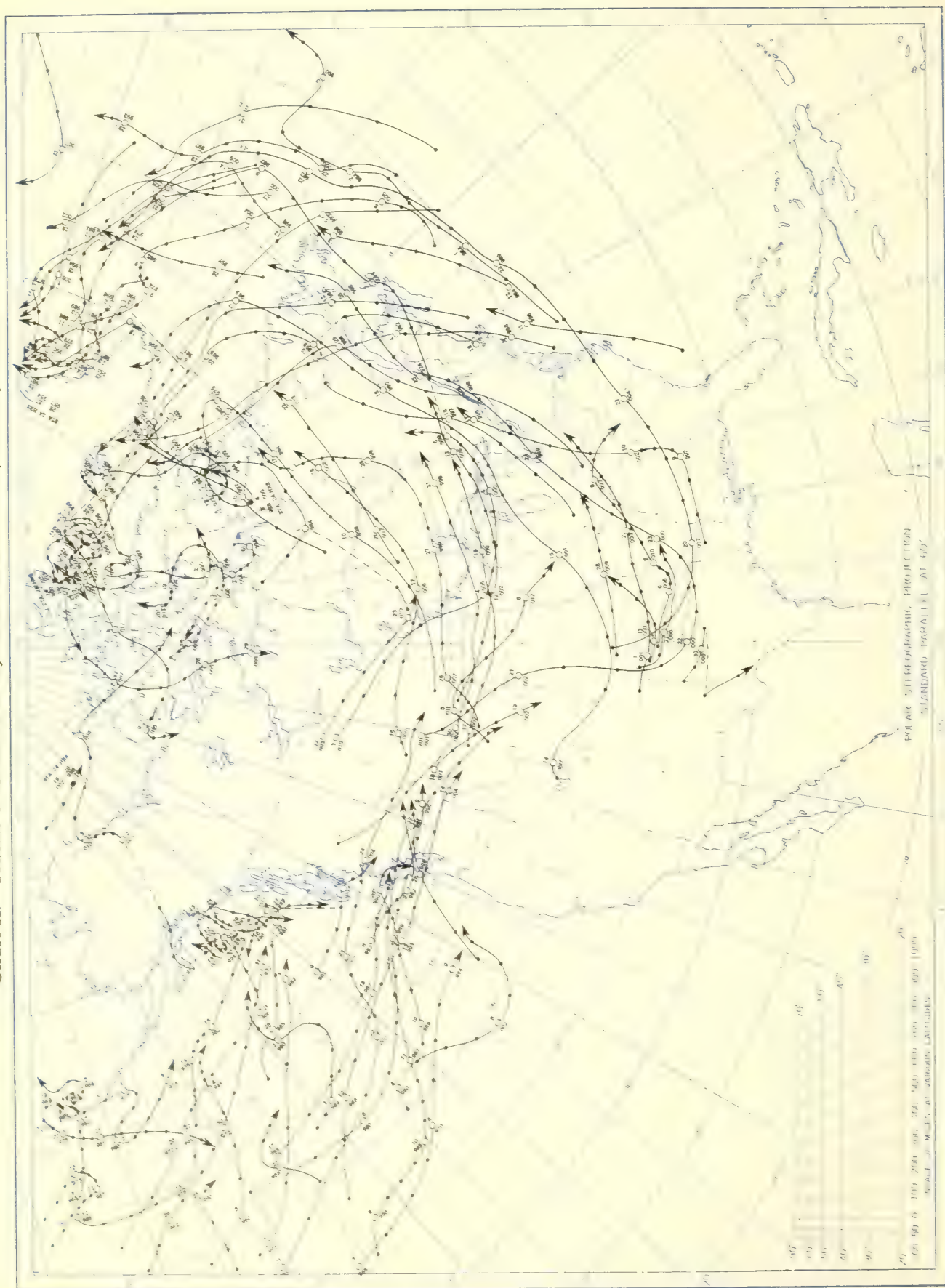
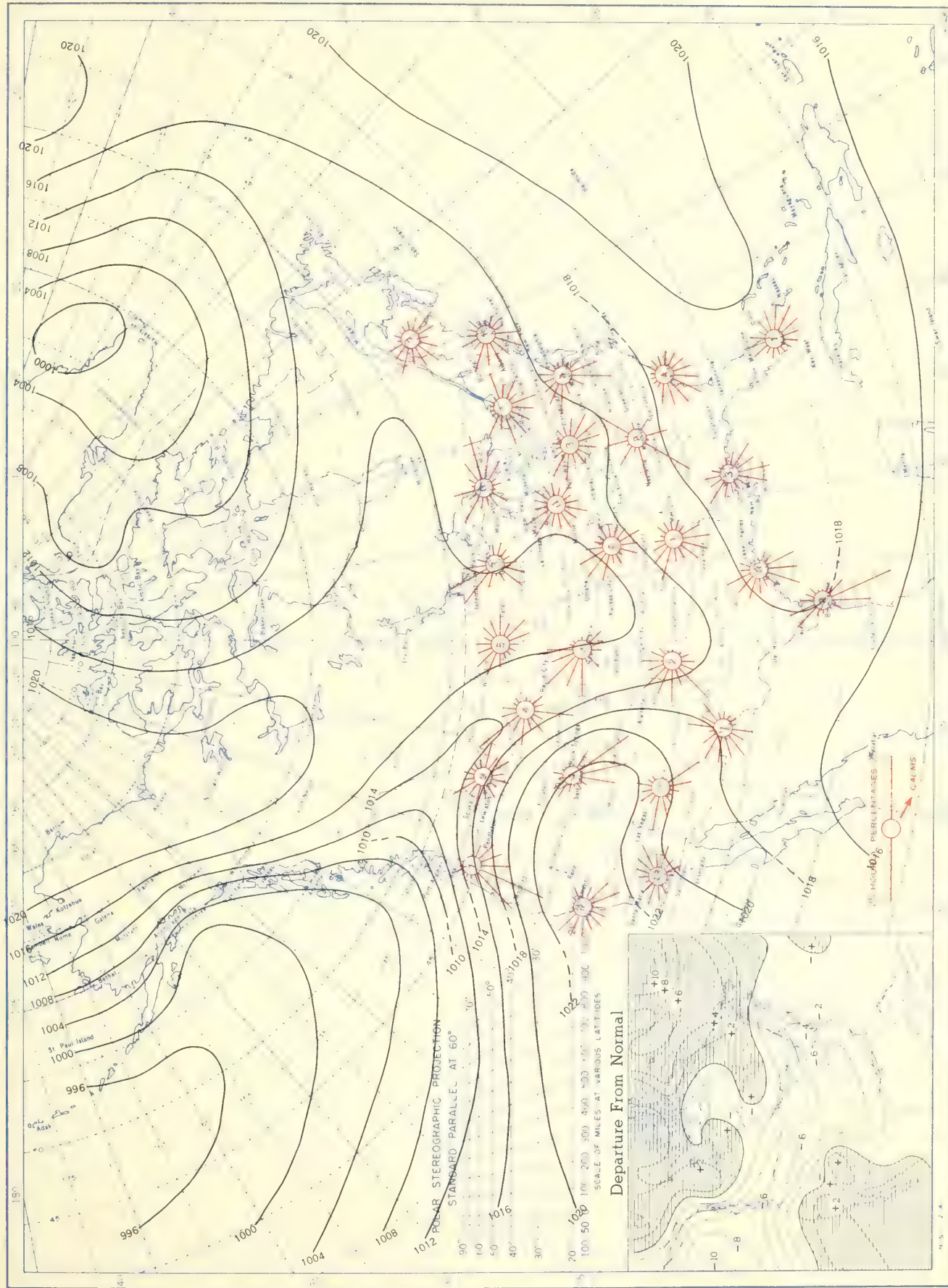


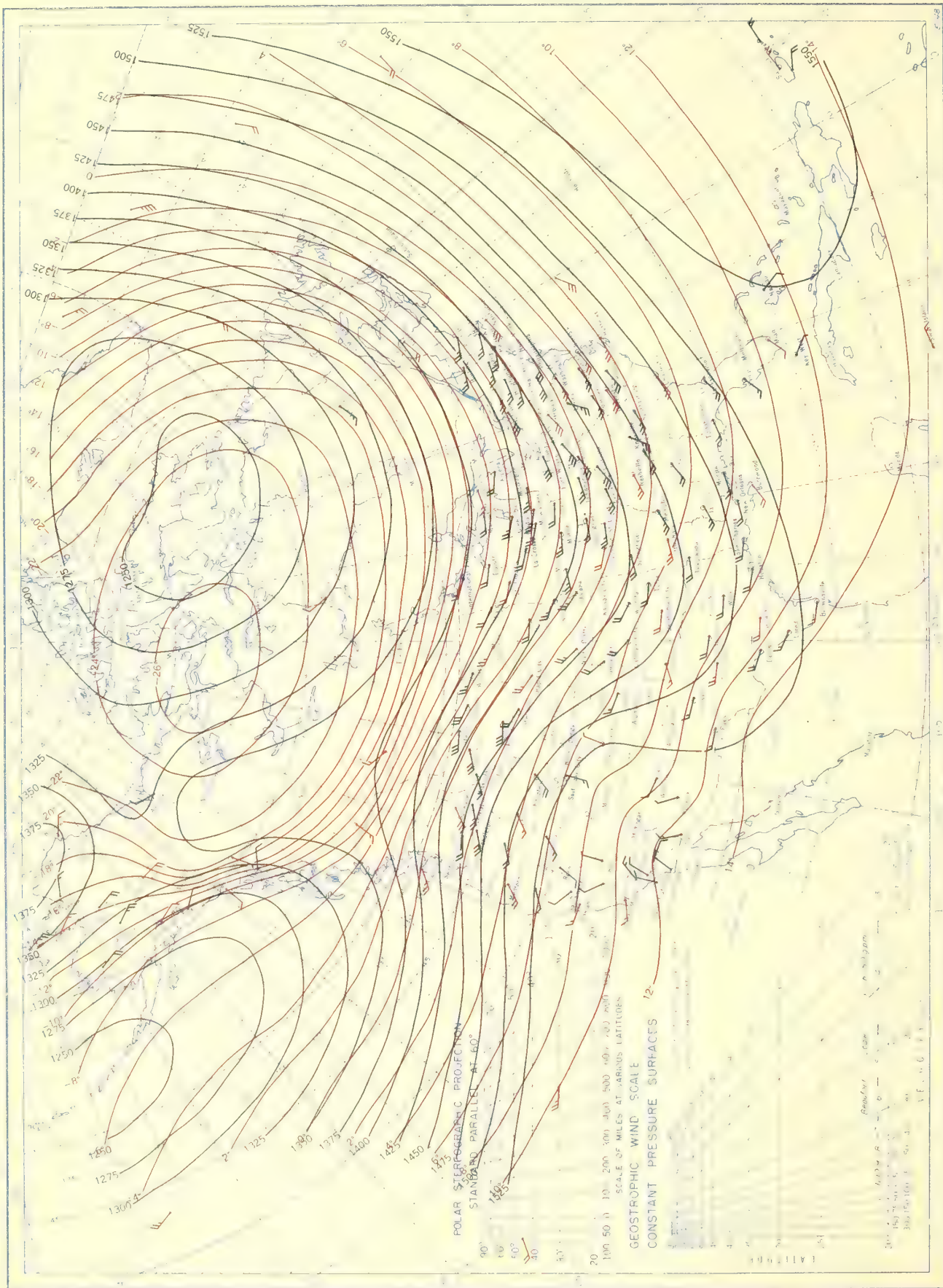
Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, January 1953. Inset: Departure of Average Pressure (mb.) from Normal, January 1953.



Average sea level pressures are obtained from the averages of the 7:30 a.m. and 7:30 p.m. E.S.T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° inter-sections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.



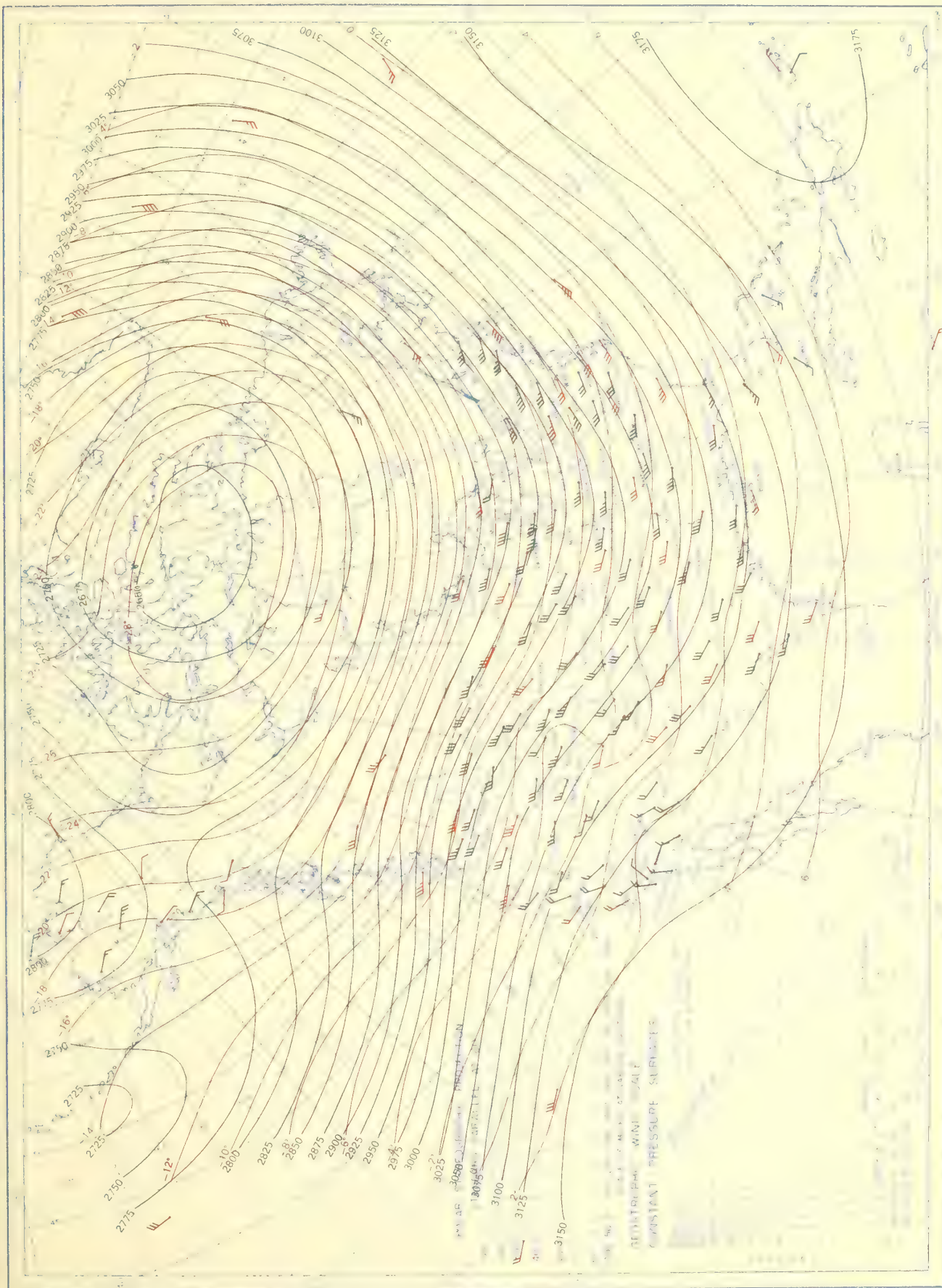
Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), January 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.



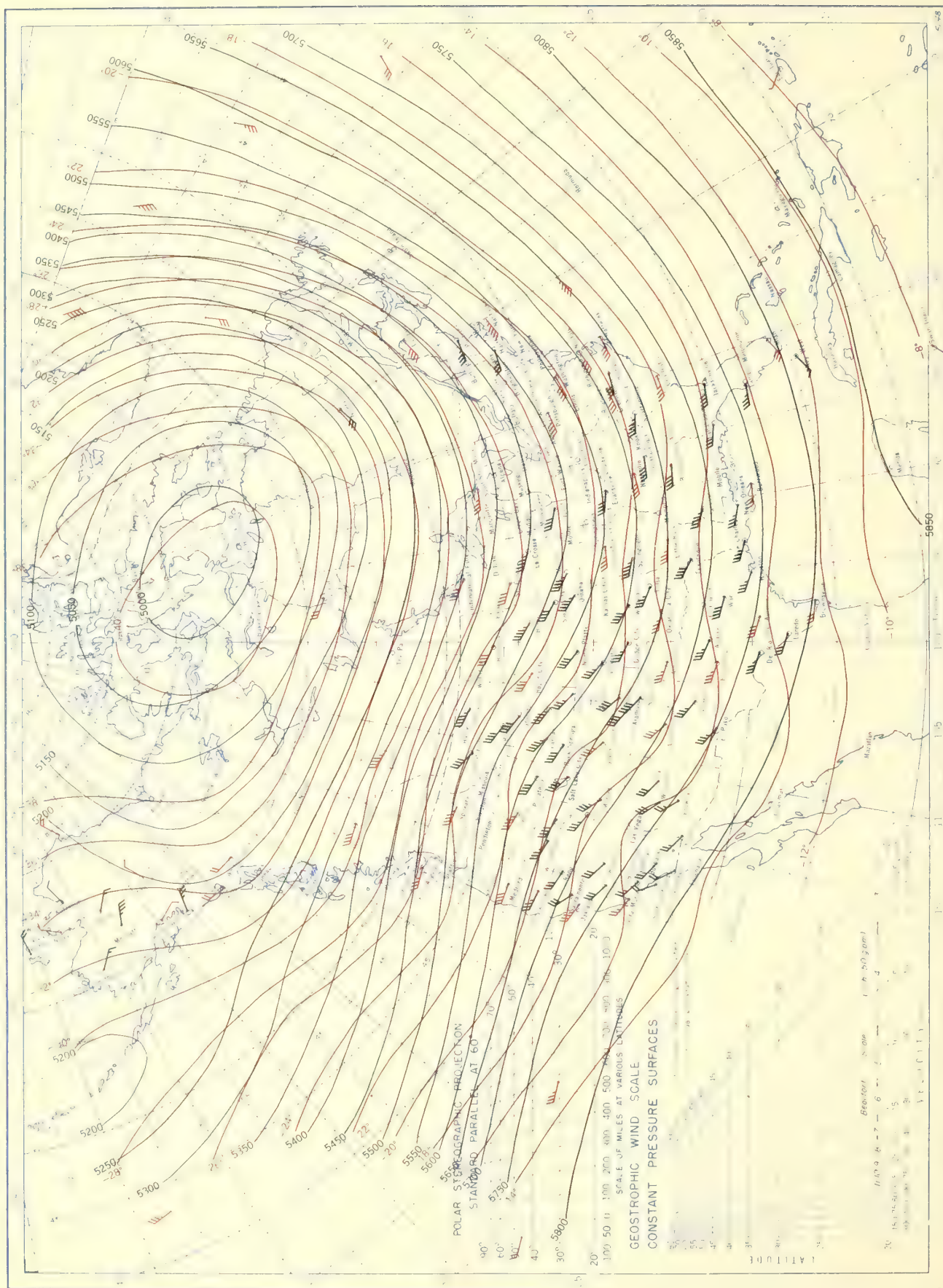
# Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), January 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawinsonde observations at 0300 G. M. T.



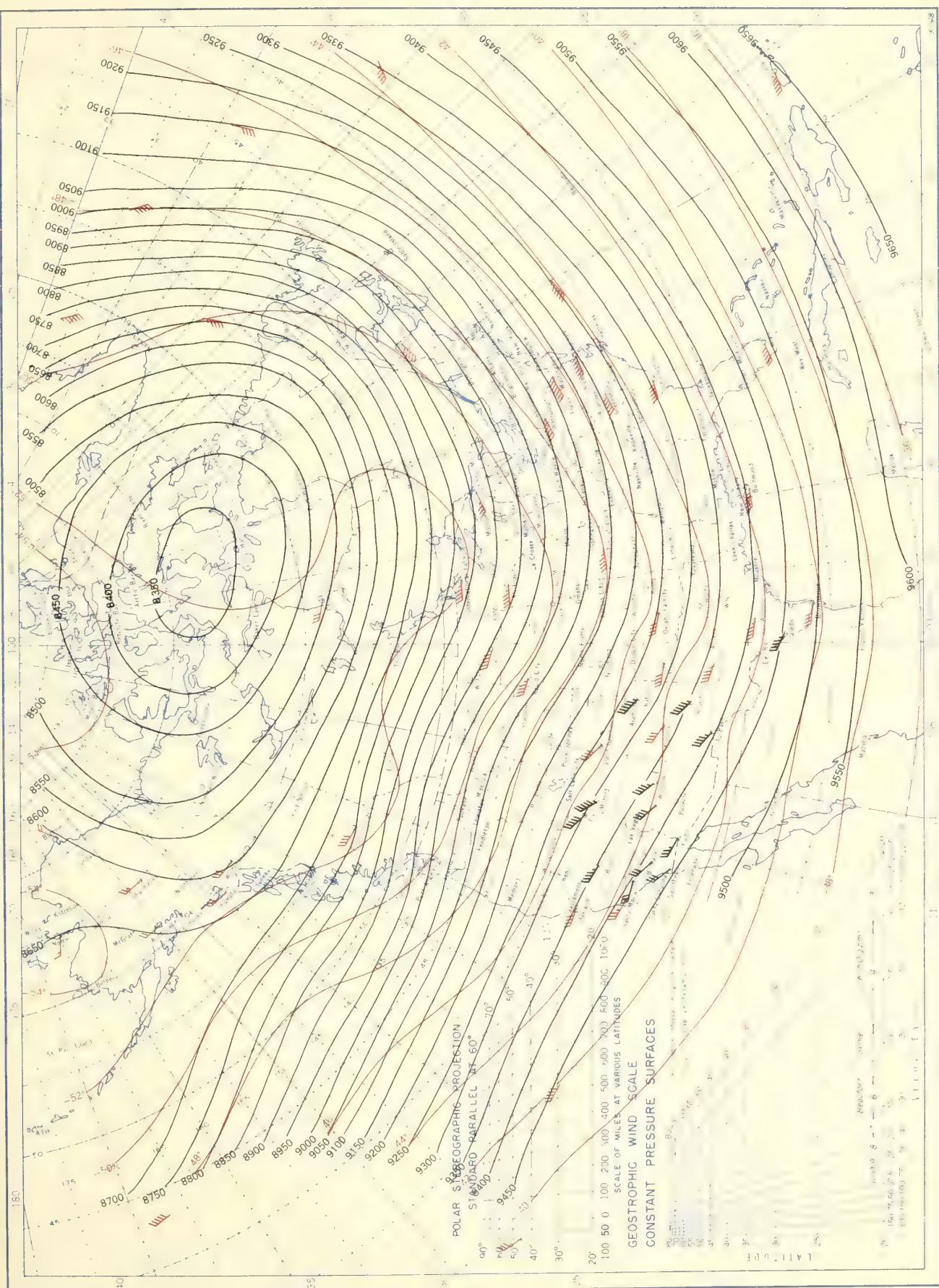
Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), January 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawinsonde observations at 0300 G. M. T.



Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), January 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.



U. S. Department of Commerce  
WEATHER BUREAU  
Official Business  
Permit No. 1024

Penalty for private use to avoid  
payment of postage, \$300

Clemson College Library  
Clemson  
South Carolina

CD

AGRICULTURE REFERENCE DEPARTMENT  
CLEMSON COLLEGE LIBRARY  
U. S. DEPARTMENT OF COMMERCE  
SINCLAIR WEEKS, Secretary  
WEATHER BUREAU  
F. W. REICHELDERFER, Chief

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

FEBRUARY 1953

Volume 4 No. 2



ASHEVILLE: 1953



## C O N T E N T S

SURFACE DATA	Page
General Summary of Weather Conditions-----	29
Condensed Climatological Data - States-----	30
Climatological Data - Stations-----	31
Heating Degree Days-----	36
Severe Storms-----	37
General Summary of River and Flood Conditions-----	42
Flood Stage Data-----	44
UPPER AIR DATA	
Radiosonde Data-----	45
Pilot Balloon Data-----	48
Rawin Data-----	49
SOLAR RADIATION DATA	
Solar Radiation Intensities-----	50
Blue Hill Data-----	51
Daily Totals and Average Daily Totals by Weeks-----	52
Daily Illumination on a Horizontal Surface-----	54
CHARTS I-XV	

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

SUBSCRIPTION PRICE: Monthly and annual, 15 cents per copy; yearly subscription, including monthly and annual issues, \$1.50. Checks and money orders should be made payable to the "Treasurer of the United States." Remittance and correspondence regarding subscriptions should be sent to "Superintendent of Documents, Government Printing Office, Washington 25, D. C."

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

Volume 4 No. 2

FEBRUARY 1953

### GENERAL SUMMARY OF WEATHER CONDITIONS

February, like the two preceding winter months, was featured by unseasonably mild temperatures, notably along the Canadian border and in the Midwest where above-normal temperatures prevailed this month on all except 3 or 4 days. Snowfall was lighter than usual in most areas, and in the far West, Midwest and Northeast the ground at lower elevations was bare much of the month. The mild, open weather was favorable for livestock, which came through the winter in good condition, and enabled farmers to stretch short feed supplies in some sections of the western Great Plains that were drought stricken during the latter part of 1952. Also, considerable outside work was accomplished, such as construction and plowing for spring crops. For the first time since November the Nation-wide average precipitation was below normal. This situation intensified the moisture deficiency in some areas which have suffered nearly continuously since last summer. In particular, the winter grains and pastures of the western portions of the lower Great Plains continued deteriorating because of lack of moisture and concurrent wind erosion of the soil. Thunderstorms were more frequent than usual for February in the lower Mississippi Valley but occurred with about normal frequency elsewhere. Wind movement was above average and caused serious dust storms in the drier sections of the lower Great Plains, the worst ones occurring during the third week. For example, on the 15th winds of 45 to 60 m.p.h. in northwestern Kansas carried dust 14,000 feet above the surface, damaged wheat, and caused a number of traffic accidents indirectly through low visibility, which at times was reduced to a few feet. Also on the 15th a record high wind of 65 m.p.h. occurred at Wilmington, N. C., as a storm moved up the Atlantic Coast. Sunshine was near or above normal in nearly all sections of the Country.

**TEMPERATURE.**—The first 10 days were unseasonably warm except for a sharp cold wave in the Northeast on the 1st and 2d, and average temperatures for this decade were generally 3° to 12° above normal except that in the Florida Peninsula they were near or slightly below normal. Also, during the first 10 days most stations in the central and northern Great Plains and far West recorded their highest temperatures of the month. At Salt Lake City, Utah on the 3d the temperature rose to 65°, the highest so early in the year at that station since records began in 1874. At Indio Date Garden, Calif., 95° on the 8th was February's highest recorded temperature; Rio Grande City, Tex., reported 92° on the 20th and Eustis, Fla., 91° on the 21st. Light freezes occurred in some sections of the South on the 5th, 8th, and 9th, but caused no damage.

During the following 14 days (11 to 24) most sections experienced their coldest weather of the month. Freezing occurred on several nights in southern portions of California, slightly damaging unheated citrus groves in the Los Angeles district and tender vegetables and early-set fruit in the San Diego area. A minimum of 22° was recorded in the vicinity of Fresno, Calif. on the 21st. On

the same date the lowest temperature of the month, -43°, was registered at Taylor Park, Colo. when subzero minima were widespread over the Rocky Mountains and north-central interior for the only time during the month.

Most stations from the upper Mississippi Valley to the Atlantic Coast recorded their lowest temperatures during the cold wave on the 1st and 2d. A 24-hour temperature fall of 40° occurred at Sault Ste. Marie, Mich., and the minimum of -33° at International Falls, Minn. on the 1st was the lowest temperature recorded east of the Rocky Mountains during the month.

**PRECIPITATION.**—Precipitation, without any unusually heavy amounts, was generally well distributed through the month. Falls covering the eastern half of the nation from the 10th to the 12th were mostly light to moderate except for 1 to 3 inches which fell during thunderstorms in Arkansas and Tennessee. An area of low barometer and moderate to heavy rains on the 14th and 15th crossed the northern Gulf of Mexico, passed up the Atlantic Coast, and caused heavy rains in the Southeast on the 20th and 21st. Flooding along the Coosa and Alabama Rivers in Alabama caused some damage, and minor flooding occurred in New York. At the end of the month soil moisture was ample to excessive east of the Mississippi.

Precipitation was much above average February amounts in Wyoming, South Dakota, Iowa, and northern Nebraska, most of which fell as snow and furnished much-needed soil moisture. In contrast, February moisture was less than 50 percent of normal in many sections of Kansas, Colorado, New Mexico, Oklahoma, and Texas, where drought conditions have persisted since the summer of 1952.

**SNOWFALL.**—Snowfall was above normal along the eastern slope of the Continental Divide and in the north-central interior from the Divide to the upper Great Lakes except in North Dakota and northern Minnesota. In a triangular-shaped area, with Denver, Colo., Butte, Mont., and Duluth, Minn. at the vertices, snowfall was 200 to 300 percent of normal with heaviest amounts in northeastern Wyoming and in a belt extending thence through central South Dakota. Record February totals of 33.9, 26.1, and 23.7 inches were recorded at Lander and Sheridan, Wyo., and Rapid City, S. Dak., respectively. Other areas receiving above normal amounts were small and included extreme northern New England, a few sections in New York, the extreme southern Appalachian Region, and the eastern portion of Millard County, Utah. In the Utah area on the 8th and 9th, 42 inches of snow with a water content of 4.42 inches fell at Kanosh, and 47 inches with a water content of 4.75 inches at Cove Fort. In the lower Appalachians 8 inches fell at Knoxville, Tenn., on the 14th and 15th.

In New York and New England light snows were frequent the first half of the month, with some locally heavy amounts in New York near the Great Lakes. On the 9th and 10th, 3 to 13 inches of snow fell in parts of South Dakota and up to 15 inches in Minnesota. Snowfall was more general in north-central areas from the 18th to the 21st,



# GENERAL SUMMARY OF WEATHER CONDITIONS—Continued

FEBRUARY 1953

when 7 to 20 inches in southern and eastern South Dakota, up to 10 inches in northwestern Iowa, and 8 to 14 inches in central and southwestern Minnesota drifted badly, blocking many roads. In some sections of the Midwest and East, snowfall was the lowest on record for February. The State-wide average of 0.2 inch for Missouri equaled the low monthly record established in 1935, and the 0.7 inch for New Jersey equaled the low record set in 1925.

**DESTRUCTIVE STORMS.**—Most of the storm destruction occurred from about the 18th to the 21st as an extensive area of low barometric pressure over the Southwest moved northeastward across the Coun-

try. On the 18th winds up to 69 m.p.h. caused \$10,000 damage in Winslow, Ariz. On the 19th and 20th in eastern portions of Colorado and Wyoming high winds caused widespread minor damage that was estimated at \$45,000 in Colorado, and several persons were killed in traffic accidents which were due to blowing snow and dust. On the 20th losses from severe thunderstorms and tornadoes in Arkansas, Mississippi, and Alabama totaled over \$300,000 according to preliminary estimates. On the 21st gale-force winds and heavy rains in New York and New England caused several thousand dollars damage.

## CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

FEBRUARY 1953

Section	Temperature								Precipitation							
	Average	Departure from normal	Station	Monthly extremes				Average	Departure from normal	Monthly extremes				Least		
				Highest	Date	Station	Lowest			Date	Station	Greatest	Station			
*F.	*F.		*F.			*F.		In.	In.		In.		In.			
Alabama	49.8	+0.8	Headland	84	25	Valley Head	16	16	7.35	+2.09	Thomasville	11.21	Elba	4.64		
Arizona	43.8	-1.2	Yuma WB AP	88	7	Maverick	-17	20	.54	-.72	Young 12 N	2.26	Littlefield	.00		
Arkansas	45.8	+2.1	2 Stations	79	27	Mount Magazine	9	21	3.08	-.51	Portland	8.21	Siloam Springs	.92		
California	48.0	+9.9	U.S. Indio Date Gar.	95	8	Twin Lakes	0	18	.51	-3.51	Gasquet RS	10.21	80 Stations	.00		
Colorado	27.7	+4.4	John Martin Dam	78	28	Taylor Park	-43	21	.51	-.50	Sugarloaf Res.	2.20	Fountain 9 NE	.00		
Connecticut	33.8	+6.9	Falls Village	65	21	Norfolk 2 SW	3	2	3.03	-.42	Cockaponset RS	4.76	Kent	2.07		
Delaware	39.8	+5.0	2 Stations	70	21	4 Stations	14	2	3.08	-.11	Lewes	3.99	Middletown 2 S	2.37		
Florida	63.1	+2.5	Eustis 2 S	91	21	Niceville	24	18	3.41	+3.35	Compass Lake	9.67	Gainesville Univ.	1.05		
Georgia	51.3	+1.5	2 Stations	84	21	Blairsville Exp.Sta.	15	18	6.24	+1.58	Flat Top	10.86	Folkston 3 SSW	2.77		
Idaho	31.5	+3.5	Mountain Home	72	3	Island Park Dam	-32	20	1.53	-.19	Pierce RS	6.01	Grouse	.02		
Illinois	36.1	+6.2	Sparta	66	2	Aurora College	-12	17	1.53	-.39	Monmouth	3.08	Rushville	.52		
Indiana	35.8	+5.2	Tell City Pwr. Pl.	66	3	Collegeville St.Jos.	-10	17	1.35	-1.05	Ogden Dunes	2.95	2 Stations	.40		
Iowa	27.7	+5.1	Sidney	60	26	Iowa City CAA AP	-16	17	1.72	+6.3	Monmouth 4 SW	4.10	Britt	.58		
Kansas	39.5	+5.5	2 Stations	77	4	2 Stations	-6	21	.66	-.32	Arkansas City	2.16	2 Stations	T		
Kentucky	41.4	+4.0	Hindman Sett. Sch.	69	3	3 Stations	11	17	2.09	-1.40	Middlesboro	5.43	Carrollton Lk. 1	.78		
Louisiana	53.2	-4.4	Donaldsonville	81	20	2 Stations	24	22	6.81	+2.35	Stevenson Fire D.T.	10.62	Rodessa	2.35		
Maine	23.9	+5.6	Portland WB AP	59	21	Fort Kent 1 SE	-17	12	3.38	+4.44	Machias	6.82	The Forks	1.42		
Maryland	40.2	+6.5	2 Stations	76	21	Sines Deep Creek	4	18	2.65	-.25	Ocean City	4.02	Rockville	1.41		
Massachusetts	32.7	+6.2	Knightville Dam	64	22	West Cummington	-2	5	3.78	+4.0	Rochester	6.62	Stockbridge	2.22		
Michigan	25.5	+5.4	2 Stations	59	21	Beechwood	-23	1	2.08	+4.4	Bergland	5.06	Bad Axe	.15		
Minnesota	15.3	+3.0	Winona	47	24	Int. Falls WB AP	-33	1	.95	+2.0	Canby	2.30	Warroad	.11		
Mississippi	50.4	+7.7	Crystal Springs	80	27	Kipling	21	18	7.86	+2.83	Rockport	12.42	Lake Cormorant	4.51		
Missouri	40.1	+6.4	Warrenton 1 N	75	18	Black 6 NW	0	22	1.65	-.45	Deering	4.63	Oregon	.58		
Montana	27.8	+6.8	Huntley Exp. Sta.	64	1	West Yellowstone	-35	20	.88	+2.27	Summit	4.50	2 Stations	T		
Nebraska	31.1	+4.5	3 Stations	75	1	Merriman	-14	21	1.11	+4.2	Harrison	2.99	Moorefield	.09		
Nevada	36.5	+1.4	North Las Vegas Dox	79	6	2 Stations	-4	10	.22	-.79	Jarbridge	2.10	11 Stations	.00		
New Hampshire	25.9	+6.2	2 Stations	62	21	First Conn. Lake	-16	2	2.64	-.05	Cannon Mtn.	4.58	Bethlehem	1.38		
New Jersey	37.3	+6.3	Canoe Brook	73	22	Layton 3 NW	4	2	2.60	-.80	Pleasantville	4.29	Cedar Grove	1.54		
New Mexico	36.5	-1.9	Hobbs	83	4	Gavilan	-30	22	.59	-.05	Eicks Ranch	2.90	Aztec Ruin N. Mon.	T		
New York	28.5	+5.8	Cairo	73	21	3 Stations	-19	2	2.04	-.62	Hooker	5.58	Dansville CAA AP	.55		
North Carolina	46.5	+3.1	3 Stations	79	21	Mount Mitchell	3	17	5.15	+1.22	Cowetta No. 8	14.32	Yanceyville	2.78		
North Dakota	18.7	+8.2	do	54	4	Napoleon 1 SE	-27	16	.33	-.14	Forbes 13 NW	1.27	3 Stations	.05		
Ohio	35.3	+5.1	Milford	64	20	Wauseon Swg.	-8	18	1.24	-1.14	Portsmouth	2.22	Willoughby 4 N	.58		
Oklahoma	45.2	+2.5	Frederick	79	19	Kenton	-6	11	1.11	-.50	Kiamichi Tower	3.76	Hooker	T		
Oregon	38.0	+2.2	Illaha 1 N	74	26	Seneca	-11	20	3.71	+3.39	Quartzville 12 SW	15.73	00 Ranch	.45		
Pennsylvania	34.0	+5.4	Wellsville	72	21	2 Stations	-4	2	2.11	-.66	Pimple Hill	4.54	Le Roy	.78		
Rhode Island	35.0	+5.9	Providence WB City	59	21	Greenville	5	2	4.45	+9.4	Austin	4.94	Block Island WB AP	4.09		
South Carolina	49.8	+1.9	Yemassee 4 W	80	22	Caesars Head	15	18	5.69	+1.62	Cleveland 3 NE	13.35	Summerville 2 WNW	3.72		
South Dakota	23.6	+4.3	Oelrichs	61	1	3 Stations	-22	16	1.17	+6.2	Bryant	3.40	Faulkton	.13		
Tennessee	43.9	+2.5	Memphis WB AP	73	27	Gatlinburg 2 SW	12	18	5.84	+1.32	Victory	10.08	Perryville	2.75		
Texas	50.4	-1.1	Rio Grande City	92	20	2 Stations	4	11	1.32	-.24	Bon Weir	8.33	5 Stations	.00		
Utah	31.8	+1.7	Zion Nat. Park	75	27	Cove Fort	-22	21	.54	-.72	Cove Fort	5.25	6 Stations	.00		
Vermont	24.6	+6.4	2 Stations	65	21	West Burke	-14	2	2.03	-.45	Rochester	3.92	Gilman	1.07		
Virginia	42.0	+4.6	Cape Henry WB City	77	21	2 Stations	9	18	3.05	+0.4	Meadows of Dan 5 SW	6.98	Front Royal 6 NNW	1.19		
Washington	38.4	+3.8	2 Stations	68	26	do	0	19	2.75	-.78	Scenic	13.31	Sunnyside	.04		
West Virginia	37.6	+3.9	Kearneysville 1 NW	72	21	Kumbrabow State For.	-8	18	2.66	-.44	Kumbrabow State For.	5.54	Wheeling Warwood Dam	1.15		
Wisconsin	19.3	+2.7	Kenosha	55	20	Gordon	-31	16	2.15	+9.5	Chilton	3.58	2 Stations	.77		
Wyoming	24.3	+2.1	Torrington Exp. Fm	67	3	Bondurant	-42	20	1.00	+2.2	Esterbrook	5.56	Diversion Dam	.05		
*Alaska	4.6	+3.5	Five Finger Light	56	24	Allakaket	-46	21	1.76	-.05	Whittier	33.23	2 Stations	T		
*Hawaii	68.5	+3.3	Puunene CAA AP	88	14	Kole Kole	31	7	1.80	-6.21	Palolo Valley	10.86	9 Stations	.00		
Puerto Rico	73.0	+1.1	Ponce	92	4	Garzas Dam	51	1	1.12	-2.07	Indiera Baja (near Maricao)	4.99	Potala (3)	.00		

° Other dates also.

\* December 1952.

\*\* January 1953.

Arizona, January 1953 - Temperature departure from normal should read +5.5  
Precipitation departure from normal should read -.71

## CLIMATOLOGICAL DATA

Table 2

FEBRUARY 1953

State and station	Elevation (ground)	Pressure				Temperature								Precipitation										Wind				No. of days (sunrise)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point	Average relative humidity	Total	De-pure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		to sunset																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
												Max. 90° F or above	Min. 32° F or below						.01 inch or more	With thunderstorms	Total	Max. depth on ground			Speed	Direction	Date	Clear	Partly cloudy	Cloudy																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											</

See footnotes at end of table



## CLIMATOLOGICAL DATA

Table 2-Continued

FEBRUARY 1953

State and station	Elevation (ground)	Pressure			Temperature										Precipitation										Wind				No. of days (sunrise)		Sky cover / tenths (sunrise to sunset)	Possible sunshine			
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max. 90° F. or above	No. of days Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days .01 inch or more	With thunderstorms	Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		Date	Clear	Partly cloudy	Cloudy					
																					In.	In.			In.	In.							In.	In.	In.
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.	°F.	°F.			°F.	%	In.	In.	In.																		
INDIANA																																			
Evansville	383	1003.4	1019.6	51	30	40.4	+2.9	64	20	16	17	0	20	29	68	1.41	-1.54	.09	5	0		10.7	SSW	47	NW	16	11	4	13	5.9	59				
Fort Wayne	801	984.4	1016.6	41	23	32.0	+4.0	58	20	-1	17	0	25	24	73	1.43	-.34	.49	9	0	5.2	10.0	SW	44	SW	6	3	9	16	7.4	46				
Indianapolis	793	987.8	1018.0	46	26	35.6	+4.1	60	20	8	17	0	24	24	68	1.93	-.15	.57	7	0	.3	13.6	WSW	45	W	27	7	8	13	6.0	56				
South Bend	768	987.5	1016.3	40	23	31.5	+5.1	58	20	4	18	0	25	23	73	1.28	-.28	.99	9	0	6.1	4	*47	SW	47	SW	6	3	8	17	7.9	--			
Terre Haute	585	995.3	1018.3	46	27	36.6	+4.2	60	20	9	17	0	23	26	73	1.52	-.62	.96	4	1	T	11.1	S	47	SW	5	9	6	13	6.1	53				
IOWA																																			
Burlington	694	990.5	1017.0	42	23	32.8	+4.8	58	18	0	17	0	25	24	71	2.52	+1.11	1.60	8	1	1.1	12.7	W	42	W	21	6	10	12	6.1	64				
Charles City CO	1013	978.3	-----	31	16	23.6	+2.9	45	20	-2	1	0	28	--	--	1.33	+1.18	.66	5	0	1.1	3	7.2	---	22	W	20	7	10	15	6.6	39			
Davenport CO	579	-----	-----	39	23	31.2	+3.5	55	20	0	17	0	25	--	--	2.67	+1.36	1.31	9	1	7.0	7	---	---	---	---	---	---	---	---	---	---	---		
Des Moines	948	984.8	1017.0	38	21	29.6	+3.6	52	23	-3	17	0	28	23	79	2.00	+.92	.67	9	0	9.9	4	13.1	NNW	47	W	26	7	7	14	6.4	50			
Dubuque	1065	975.3	1015.8	34	17	25.5	+2.9	51	20	0	*1	0	28	19	80	3.61	+2.50	2.24	6	0	2.1	1	*31	WNW	27	6	6	16	6.9	49					
Sioux City	1093	974.3	1017.3	34	16	25.3	+2.1	48	26	-7	21	0	28	20	80	1.20	+.45	2.50	9	1	9.1	6	NW	42	NW	20	6	6	16	7.0	46				
KANSAS																																			
Concordia CO	1375	965.5	-----	50	27	38.7	+5.8	66	4	7	21	0	21	--	61	.45	-.40	.18	7	0	.7	9.2	---	38	NW	*16	11	9	8	4.9	66				
Dodge City	2594	926.9	1016.6	53	25	38.9	+3.9	73	4	6	21	0	25	20	51	.15	-.63	.09	4	3	1.4	17.3	NW	72	NW	20	13	12	3	4.3	72				
Goodland	3645	886.6	1016.5	49	15	32.1	+1.9	70	1	-5	21	0	27	15	54	.58	+1.0	.54	4	0	5.6	5	14.1	NW	*45	NNW	15	10	7	11	5.3	--			
Topeka	879	980.7	1016.6	52	28	39.8	+6.4	66	*4	11	21	0	22	27	65	1.57	+6.0	.77	8	1	T	10.5	S	40	NW	16	12	4	12	5.4	76				
Wichita	1372	967.5	1017.2	52	30	40.9	+3.7	69	4	11	21	0	17	25	59	.82	-.16	.43	5	1	T	1	15.6	S	49	NW	15	10	8	10	4.9	54			
KENTUCKY																																			
Lexington	979	982.4	1019.1	49	29	39.4	+4.9	60	*2	16	17	0	19	28	67	1.44	-2.06	.64	7	0	T	14.2	SSE	---	---	---	---	7	8	13	6.4	--			
Louisville CO	457	-----	-----	51	33	42.1	+4.3	64	20	17	17	0	15	--	--	.82	-2.17	.50	4	0	T	0	---	---	---	---	---	---	---	---	---	---	---		
Louisville	485	1002.0	1018.6	51	31	41.0	+3.8	63	20	17	17	0	17	28	64	-.87	-2.12	.45	6	0	T	0	9.6	SW	46	SW	16	9	6	13	6.0	56			
LOUISIANA																																			
Baton Rouge	64	1016.3	1019.3	64	46	55.0	-.6	77	11	33	18	0	0	46	75	6.72	+2.36	1.73	13	5	T	0	9.5	SE	---	---	---	---	4	8	16	7.3	--		
Lake Charles	12	1018.0	1019.2	63	46	54.8	-1.1	75	4	37	21	0	0	47	79	5.03	+5.50	1.47	11	6	T	0	12.3	N	41	SE	14	3	7	18	7.8	--			
New Orleans CO	12	1017.3	-----	65	49	57.2	-1.3	75	20	38	21	0	0	46	75	6.93	+2.75	2.34	14	3	T	0	11.9	---	35	NE	14	4	10	14	7.0	50			
New Orleans	3	1016.9	1019.2	65	48	56.4	-1.0	79	20	36	18	0	0	48	76	7.10	+3.13	2.46	15	5	T	0	11.9	N	*45	NE	14	4	8	16	7.0	--			
Shreveport	252	1009.5	1019.3	61	40	50.7	-1.0	76	27	30	*21	0	3	42	75	3.98	+.20	1.55	9	5	T	0	9.3	N	---	---	---	---	8	3	17	6.4	58		
MAINE																																			
Caribou	624	986.1	1010.6	26	8	17.4	+7.6	47	21	-13	2	0	28	10	72	2.02	+.29	.65	12	0	16.5	13	14.4	WSW	*50	WSW	16	7	4	17	7.0	--			
Eastport CO	33	1008.5	1011.5	35	20	27.5	+5.4	51	21	-1	2	0	26	--	--	6.09	+3.40	1.60	13	0	9.9	4	13.9	---	58	SE	15	8	7	13	6.0	46			
Portland	61	1008.8	1012.8	37	18	27.6	+6.1	59	21	0	14	0	25	20	73	3.30	-.53	1.86	13	0	9.4	4	11.8	W	46	NW	1	10	6	12	6.0	55			
MARYLAND																																			
Baltimore CO	14	-----	-----	50	35	42.2	+4.9	74	21	22	2	0	10	--	--	2.77	-.22	1.01	8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Fredrick	146	1015.9	1017.8	50	30	40.0	+4.3	73	21	19	2	0	19	24	57	2.74	-.25	1.04	8	---	T	0	12.2	NW	52	---	NW	15	7	10	11	6.0	50		
Fredrick	294	-----	-----	49	27	38.0	+3.9	71	21	15	2	0	22	--	--	1.95	-.63	.88	7	---	T	0	---	---	---	---	---	---	---	---	---	---	---	---	
MASSACHUSETTS																																			
Blue Hill Obs.	640	989.6	-----	41	24	31.3	+5.6	56	*21	5	2	0	25	--	72	4.45	+.92	1.55	14	0	17.2	9	18.6	NNW	50	S	21	11	8	9	5.2	52			
Boston	12	1008.8	1013.7	42	28	35.0	+5.8	60	21	10	2	0	22	22	63	4.14	+1.21	1.56	12	0	11.4	5	14.6	NNW	43	NW	1	11	5	10	6.3	56			
Nantucket	43	1013.5	1014.3	42	29	35.6	+4.5	57	7	14	2	0	20	29	77	5.37	+1.95	2.32	9	0	2.3	2	15.4	NNW	47	S	21	8	9	11	5.9	60			
Pittsfield	1153	970.2	1014.2	36	18	26.9	+5.2	60	21	1	5	0	28	--	--	2.30	-.21	.64	14	0	13.8	6	---	---	---	---	---	---	7	10	11	6.1	--		
MICHIGAN																																			
Alpena CO	587	990.5	-----	31	19	25.1	+5.2	43	21	-1	1	0	28	--	--	1.93	+.48	.75	14	0	13.1	7	11.1	---	38	SW	6	2	6	20	8.3	34			
Detroit	619	988.2	1015.9	39	25	32.2	+5.5	56	22	8	1	0	23	22	68	.82	-1.20	.51	9	0	.7	12.6	W	49	W	21	6	2	6	16	7.0	33			
Escanaba CO	594	990.5	-----	28	13	20.6	+3.0	38	26	-8	22	0	22	--	--	2.43	+1.05	.92	14	3	T	0	26.6	---	26	N	28	5	10	13	6.9	53			
Grand Rapids	681	989.2	1015.2	37	23	29.7	+5.9	55	20	6	1	0	26	23	77	1.61	-.06	.76	12	1	6.7	1	12.9	WSW	46	S	6	2	4	22	8.4	29			
Lansing	859	982.4	1015.6	37	22	29.4	+5.2	55	20	4	1	0	27	22	75	1.03	-.78	.43	15	1	2.4	T	15.4	W	45	W	27	3	4	21	7.8	24			
Marquette CO	677	985.1	-----	27	16	21.4	+2.5	43	5	-7	1	0	28	--	--	2.47	+.75	.88	21	--	28.4	33	7.8	---	23	NN	*21	0	4	24	9.0	28			
Muskegon	627	991.2	1015.0	35	23	29.2	+4.7	52	20	6	1	0	26	23	77	2.34	+.70	1.10	13	1	4.9	2	11.9	NNW	*41	WSW	21	0	5	23	8.9	--			
Sault Ste. Marie	721	989.5	1013.2	26	13	19.4	+5.9	41	21	-14	1	0	28	15	81	2.58	+1.06	.95	20	0	21.1	30	8.5	NW	*34	W	21	0	6	22	8.9	33			
Pittsfield	722	986.5	1015.6	39	23	31.2	+5.1	58	20	5	18	0	25	22	71	.80	-.94	.46	7	0															

See footnotes at end of table.



## CLIMATOLOGICAL DATA

FEBRUARY 1953

Table 2-Continued

State and station	Elevation (ground)	Pressure		Temperature										Precipitation										Wind		No. of days		Sky cover, tenths (sunrise to sunset)	Possible sunshine																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
		Station	Sea level	Average					Departure from normal					No. of days					Snow, Sleet, Hail					Fastest mile		to sunset																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
				Maximum	Minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F or above	Min. 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days	Snow, Sleet, Hail	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear			Partly cloudy	Cloudy																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														



## CLIMATOLOGICAL DATA

FEBRUARY 1953

Table 2--Continued

[illegible]

See footnotes at end of table.

## CLIMATOLOGICAL DATA

FEBRUARY 1953

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature										Precipitation						Wind				No. of days (sunrise to sunset)		Sky cover, tenths (sunrise to sunset)	Possible sunshine							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile									
												Max. 90° F. or above	Min. 32° F. or below						Of inch or more	With thunderstorms	Total	Max. depth on ground			Speed			Direction	Date	Clear	Partly cloudy	Cloudy		
Ft.	Mh.	Mh.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	%	In.	In.	In.	In.	In.	M. p. h.	M. p. h.	0-3	4-8	7-10	0-10	%									
PACIFIC AREA																																		
Canton Island	9	1008.8	1009.3	89	79	84.1	+1.1	94	2	75	22	10	0	74	75	0.61	+0.07	0.24	9	0	0	0	0.0	0	---	---	---	---	2	14	12	7.1	---	
Hilo	28	1015.6	1017.1	78	62	69.9	-.8	82	4	57	10	0	0	62	82	13.01	+3.53	3.69	21	6	0	0	0	5.1	---	---	E	10	12	14	7.3	49		
Honolulu CO	12	-----	-----	78	68	72.9	+.9	82	11	61	28	0	0	---	---	2.66	+.17	1.60	10	5	0	0	0	---	---	---	---	---	---	---	---	---	---	
Honolulu	7	1016.9	1017.5	80	67	73.3	+.9	84	8	62	28	0	0	62	72	2.87	+.35	1.43	8	5	0	0	0	9.9	ENE	35	NE	13	5	17	6	5.6	55	
Koror CO	94	1006.1	1009.8	88	74	81.0	---	91	24	72	19	5	0	---	---	4.07	---	1.19	21	0	0	0	0	4.4	---	14	N	4	0	13	15	7.9	---	
Lihue	115	1012.5	1017.7	78	65	71.6	+1.5	80	5	57	28	0	0	64	79	3.71	-.73	.87	17	0	0	0	0	11.0	NE	27	NE	13	8	14	8	5.6	58	
Moan (Truk Group)	3	1011.2	1011.7	85	77	80.5	---	85	1	74	2	0	0	---	---	6.34	---	1.96	16	0	0	0	0	---	---	---	---	0	2	26	9.4	---	---	
Ponape CO	112	1007.5	1012.5	86	76	81.1	-.8	89	23	71	21	0	0	---	---	10.44	+2.57	5.91	21	0	0	0	0	---	---	---	---	1	2	25	8.6	---	---	
Wake Island	11	1016.9	1017.3	82	74	77.6	+.3	84	3	69	6	0	0	69	75	3.16	+1.65	1.45	16	0	0	0	0	12.7	ENE	---	---	---	11	13	4	4.5	---	---
Yap CO	51	1010.2	1012.1	86	76	80.7	---	88	7	72	6	0	0	---	---	9.37	---	3.98	22	0	0	0	0	---	---	---	---	1	5	22	8.5	---	---	
WEST INDIES																																		
San Juan CO	47	-----	-----	80	70	74.7	-.2	84	4	67	1	0	0	---	---	1.06	-1.61	.32	16	---	0	0	0	0	---	---	---	---	---	---	---	---	---	---
San Juan, P.R.	9	1015.9	1018.1	81	69	75.2	+.5	84	5	66	27	0	0	66	75	1.31	-1.92	.38	14	0	0	0	0	12.2	ENE	29	E	22	7	20	1	5.0	77	

Data from airport unless otherwise specified. CO indicates data from city office.

\* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

\* Other dates also.

† Peak gust.



# HEATING DEGREE DAYS

(Base 65°F.)

FEBRUARY 1953

Table 3

State and station	Current season			State and station	Current season			State and station	Current season			State and station	Current season		
	This month	Period July through this month	Long term mean July through this month		This month	Period July through this month	Long term mean July through this month		This month	Period July through this month	Long term mean July through this month		This month	Period July through this month	Long term mean July through this month
ALABAMA				INDIANA (Cont'd.)				NEW JERSEY				TEXAS (Cont'd.)			
Birmingham	441	2193	2058	Terre Haute	792	3848		Atlantic City (CO)	684	2991	3535	Amarillo	686	3086	3258
Mobile (CO)	283	1349	1305	IOWA				Newark	763	3430	4067	Austin	322	1391	1443
Mobile	304	1396		Burlington	895	4366	4503	Trenton (CO)	741	3369	3778	Big Spring	482	2004	2193
Montgomery (CO)	341	1653	1713	Charles City (CO)	1157	5427	5760	NEW MEXICO				Brownsville	85	429	551
Montgomery	374	1845	1731	Davenport (CO)	941	4361	4754	Albuquerque	732	3284	3464	Corpus Christi	180	746	855
ARIZONA				Des Moines	985	4761	4910	Clayton	857	3738	3705	Dallas	406	1897	1984
Flagstaff	958	4823	4995	Dubuque	1100	5202	5242	Raton	978	4566		Del Rio	252	1181	1325
Phoenix (CO)	267	1140	1220	Keokuk (CO)	819	3927		Roswell	617	2758	2868	El Paso	468	2066	2122
Phoenix	322	1321		Sioux City	1105	5274	5312	NEW YORK				Ft. Worth	394	1809	1559
Prescott	719	3042		KANSAS				Albany	1005	4633	4901	Galveston (CO)	253	952	1014
Tucson	352	1422		Concordia (CO)	731	3971	4170	Bear Mountain (CO)	938	4367		Galveston	262	986	
Winslow	778	3550	928	Dodge City	725	3644	3890	Binghamton	1044	4875	4935	Houston (CO)	252	1081	
Yuma	171	752		Goodland	913	4448	4235	Buffalo	956	4330	4839	Houston	263	1169	1146
ARKANSAS				Topeka (CO)	685	3657	3979	New York (CO)	755	3248	3842	Laredo	160	700	
Ft. Smith	554	2759	2630	Topeka	702	3805		La Guardia Field	727	3128		Lubbock	618	2778	
Little Rock	508	2422	2472	Wichita	670	3434	3644	Osage (CO)	984	4304	4973	Port Arthur (CO)	272	1144	1139
Texarkana	435	2107		KENTUCKY				Rochester	968	4329	4807	Port Arthur	278	1274	
CALIFORNIA				Lexington	713	3346	3634	Schenectady	971	4441		San Angelo	402	1735	
Bakersfield	391	1617	1789	Louisville (CO)	633	3029	3392	Syracuse	988	4377	4932	San Antonio	297	1297	1250
Beaumont (CO)	485	1893		Louisville	664	3199		NORTH CAROLINA				Victoria	228	1002	
Bishop	634	3016	3332	Pikeville (CO)	590	2784		Asheville (CO)	631	3082	3082	Waco	376	1673	
Blue Canyon	730	3345		LOUISIANA				Ashville	666	3339		Wichita Falls	473	2208	
Burbank	243	1125		Baton Rouge	281	1350	1288	Charlotte	497	2425	2583	UTAH			
Eureka (CO)	492	3053	3120	Lake Charles	221	1267		Greensboro	574	2841	3002	Milford	980	4239	
Fresno	459	1854	1919	New Orleans (CO)	222	951	1056	Hattiesburg	408	1700	1896	Salt Lake City (CO)	749	3452	4134
Los Angeles (CO)	180	832	989	New Orleans	232	1050		Releigh (CO)	503	2327	2581	Salt Lake City	779	3759	4472
Los Angeles	211	1024		Int. Airport, Moisant	241	1162		Wilmington	532	2537		VERMONT			
Mt. Shasta (CO)	717	3647		Shreveport	394	1855	1802	Winston-Salem	402	1844	1914	Burlington	1099	5025	5678
Oakland	391	1859	2143	MAINE				OHIO	541	2645		VIRGINIA			
Red Bluff	379	1829	2066	Caribou	1327	6521		Akron	927	4333	4533	Cape Henry (CO)	504	2269	2582
Sacramento (CO)	367	1715	2038	Eastport (CO)	1045	4928	5700	Bismarck	1193	5954	6725	Lynchburg	635	3047	3096
Sacramento	398	1877		Greenville (CO)	1399	6273	6684	Devils Lake (CO)	1360	6645	7595	Norfolk (CO)	481	2154	2560
Sandberg (CO)	632	2728		Portland	1041	4830	5197	Fargo	1360	6428	7001	Norfolk	520	2412	
San Diego	223	832	1091	MARYLAND				Grand Forks	1411	6720	7373	Richmond (CO)	561	2685	2988
San Francisco (CO)	300	2040	2133	Baltimore	636	2826	3360	Pembina	1491	6715		Richmond	598	2866	
San Francisco	414	2107	2294	Baltimore	692	3265		Williston (CO)	1210	5895	6918	Reno	621	3012	3176
San Jose	353	1551		Frederick	751	3722		OHIO				WASHINGTON			
Santa Catalina	256	1310		MASSACHUSETTS				Akron	927	4333	4533	Ellensburg	774	4302	
Santa Maria	344	1860		Boston	834	3692	4246	Cincinnati (CO)	660	3155	3707	Kelso	621	3262	
COLORADO				Milton	945	4230		Cincinnati	754	3626		North Head (CO)	561	3250	3431
Alamosa	1165	6273		Nantucket	819	3598	3881	Cleveland (CO)	823	3694	4407	Olympia	677	3559	
Colorado Springs	961	4420		Pittsfield	1059	5004		Cleveland	874	3969		Seattle (CO)	576	2699	3160
Denver	897	4094	4177	MICHIGAN				Columbus	817	3867	4100	Seattle	688	3431	
Grand Junction	887	4111	4407	Alpena (CO)	1111	5063	5701	Dayton	841	3953	4113	Spokane	834	4173	4724
Pueblo	847	3997	4146	Dearborn	913	4217	4779	Sandusky (CO)	855	3835	4423	Tacoma (CO)	610	3039	3488
CONNECTICUT				Escanaba (CO)	1239	5530	6079	Toledo	921	4245	4583	Tatoosh Island (CO)	584	3663	3921
Bridgeport	803	3618		Grand Rapids (CO)	950	4409	4869	Youngstown	920	4306		Walla Walla (CO)	598	2994	3760
Hartford	850	3997	4442	Grand Rapids	983	4704		OKLAHOMA				Yakima	698	3880	4383
New Haven	824	3779	4250	Lansing	987	4744	5169	Oklaoma City (CO)	559	2714	2930	WEST VIRGINIA			
DELAWARE				Marquette (CO)	1214	5522	6050	Oklaoma City	583	2759		Charleston	673	3154	
Wilmington	740	3440		Muskegon	999	4696		Tulsa	546	2816		Elkins	853	4123	4245
DIST. OF COLUMBIA				Sault Ste. Marie	1270	5875	6470	OREGON				Huntington (CO)	655	2924	
Washington (CO)	617	2911	3435	Ypsilanti	940	4345		Baker (CO)	913	4413	5134	Parkersburg (CO)	721	3359	3736
Washington	621	2993		MINNESOTA				Baker	962	4927		Petersburg	717	3457	
FLORIDA				Duluth (CO)	1438	6624	6857	Burns (CO)	847	4424		WISCONSIN			
Apalachicola (CO)	206	1026	1022	Duluth	1464	6735		Eugene	600	3080		Green Bay	1290	5705	5768
Daytona Beach	122	709		International Falls	1579	7432		Medford	948	4586		La Crosse	1239	5413	
Fort Myers	40	285	247	Minneapolis	1313	5757	6003	Medford	623	3144	3405	Madison (CO)	1115	4997	5477
Jacksonville (CO)	153	838	955	Rochester	1286	5921		Pendleton	661	3362		Madison	1112	5145	
Jacksonville	180	987		St. Cloud	1414	6329	6592	Portland (CO)	544	2551	3112	Milwaukee (CO)	1020	4571	5114
Key West (CO)	4	40	40	St. Paul	1300	5694	6005	Portland	586	2864		Milwaukee	1043	4786	
Key West	5	56		MISSISSIPPI				Roseburg	616	2921	3044	WYOMING			
Melbourne	67	452		Jackson	391	1855	1813	Salem	607	3066		Casper	1116	4998	
Miami (CO)	13	143	149	Meridian	410	1973	1827	Sexton Summit (CO)	785	3640		Cheyenne	1042	4856	5229
Int. Airport, Hialeah	4	106		Vicksburg (CO)	371	1715	1718	Troutdale	587	2776		Lander	1135	5199	5983
Miami Beach	6	90		MISSOURI				PENNSYLVANIA				Rock Springs (CO)	1019	5158	
Orlando	91	552		Columbia	705	3635	3912	Allentown	841	3956		Rock Springs	1104	5414	
Pensacola (CO)	242	1147	1204	Kansas City	685	3514	3885	Eric (CO)	857	3818	4453	Sheridan	1020	4774	
Tallahassee	228	1175		St. Joseph	766	4013	4152	Harrisburg	754	3614	4043				
Tampa	75	498	478	St. Louis (CO)	652	3227	3570	Park Place (CO)	976	4609					
West Palm Beach	14	185		St. Louis	693	3440		Philadelphia (CO)	673	3069	3544				
GEORGIA				Springfield	675	3446	3540	Philadelphia	725	3284					
Albany	304	1494	1377	MONTANA				Pittsburgh (CO)	752	3394	3961				
Athens	497	2314		Billings	906	4298		Pittsburgh	831	3826	4231				
Atlanta (CO)	465	2223	2374	Butte	1144	6311		Reading (CO)	734	3410	3881				
Atlanta	486	2350		Glasgow (CO)	1158	5836		Scranton (CO)	864	4015	4532				
Augusta	407	1987	1881	Great Falls	942	4588		Williamsport	871	4108	4503				
Columbus	423	2004		Havre (CO)	1011	5371	6255	RHODE ISLAND							
Macon	386	1823	1910	Helena	942	5187	5696	Block Island	796	3480	3897				
Rome	522	2625		Kelispell	911	5054	5813	Providence (CO)	801	3596	4233				
Savannah	300	1500	1356	Miles City	1022	5052		Providence							

## SEVERE STORMS

FEBRUARY 1953

Table 4

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Seattle and vicinity, Wash.	3	6:30-7:30 p.m.					\$65,000		Thunder-storm	A line of thunderstorms developed during late afternoon extending from north of Seattle to south of Centralia. 1 garage destroyed in Seattle, several windows broken, roofs damaged, and extensive damage to power and communication lines by falling trees.
St. Louis, Mo.	5	Afternoon and evening					6,000	\$ 0	Wind	High winds caused widespread light damage to roofs, windows, trees, etc. Wall of brick building collapsed. Gusts to 55 m.p.h. noted at Lambert-St. Louis Airport Station, and a fastest mile of 45 m.p.h. recorded at St. Louis City Office.
Livingston and Tangipahoa Parishes, La.	6	1-1:15 p.m.	400	15	2	21	729,000	200,000	Tornado and rain	Began in Centerville community, Livingston Parish, moved east-northeastward through Albany and north Hammond into wooded uninhabited area. 26 homes destroyed and 107 heavily damaged; 35 buildings, including warehouses, destroyed and 51 damaged. Crop damage was primarily to strawberries where damage mostly from heavy rains and flying debris.
Roosevelt Lake, Ariz.	8	Afternoon			4				Wind	4 fishermen tried to cross Roosevelt Lake during period of high winds, estimated at 36 m.p.h. Boat swamped and fishermen drowned.
Utah, northern portion	9	Early a.m.-late p.m.	*50	5		2	25,000		do	High winds caused by pressure gradient from east to west across Wasatch Mountain Range, together with venturi effect through narrow canyons that open onto metropolitan area of Utah along Wasatch Front. Roofs blown from small buildings, large windows broken, power and communication lines broken, transportation interrupted, trees and fences damaged, etc. The 2 injuries occurred in automobile accident attributed to wind.
Colorado, northeastern portion	9	5 a.m.-9 p.m.	*90	140			8,000		Wind, snow, sleet, and ice	Moderate snow and some sleet, accompanied at times by strong northwest winds, damaged transmission lines and slowed transportation. Losses generally limited to extreme northeastern counties.
Minnesota, central and southern counties	9-10						10,000		Ice (glaze), sleet, snow, and wind	Traffic delayed; some roads blocked in west-central counties where snowfall heaviest. Some damage to overhead wire-systems in extreme southwest portion. At Beardsley, 15.0 inches of snow reported to have fallen. In Worthington area, freezing rain resulted in extremely icy roads and made traveling hazardous.
Harrisburg-Lebanon area, Pa.	11	3-10 p.m.			4	3			Snow and ice (freezing rain)	4 persons killed and 1 injured when car skidded on Pennsylvania Turnpike east of Lebanon and crashed into oncoming truck. 2 persons injured in 4-car accident on Susquehanna River bridge. Many minor skidding accidents on glazed highways, and traffic tie-ups frequent on hills.
El Dorado, Ark.	11	8:45 p.m.							Electrical	3 oil storage tanks belonging to Pan-American Southern Oil Company ignited by lightning; 3,000 barrels of crude oil and 3 tanks destroyed.
Pascagoula, Miss.	14	Afternoon			2				Thunder-squall	2 men drowned when boat overturned in channel.
Colorado, northeastern and east-central portions	15	3 a.m.-midnight	*150	200			13,000	15,000	Wind	High winds, reaching gale force at times, damaged transmission lines, large signs, windows, trees, and small structures. Drifting soils resulted in damage to winter grains and reduced visibility to zero over some areas.
Chambersburg, Pa.	15	Morning			1				Snow and ice	Woman died of injuries received when she slipped and fell on icy pavement.
North Carolina, throughout State	15	Most of day					10,000		Snow, rain, and wind	A low pressure storm center moved northeastward about mid-State, causing high winds, moderate to heavy snow in mountains, and rain elsewhere. Wilmington's highest wind of record established at 65 m.p.h. from east for fastest mile. No damage reported in east, but travel disrupted in mountains, and some power and telephone lines broken down by wet snow. Numerous minor traffic accidents, but no injuries reported.
Nebraska, Panhandle section	15	Afternoon			0	0			Wind	\$600 damage to 1 roof. Widespread minor property damage, probably totaling several thousand dollars. Widespread light damage to winter wheat from blowing soil; also, wind erosion from fields.
Kansas, western and central portions	15	Late afternoon and evening				Numerous			Wind and blowing dust	Strong northwesterly winds of 45 to 55 m.p.h. and some gusts to 65 m.p.h. resulted in severe dust storms spreading from western to central Kansas. Considerable wheat loss and soil damage reported, with dust particles carried as high as 13,000 to

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

FEBRUARY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Kansas, western and central portions (Cont'd.)	15									14,000 feet. Low visibility of 0 to 1/4 mile in the blowing dust responsible for numerous traffic mishaps.
Winslow and vicinity, Ariz.	18	Afternoon					\$10,000		Wind	A portion of brick wall and roof blown down at Winslow garage, damaging stored vehicles. Portions of 2 brick walls under construction blown down. Wind speed at Winslow Airport at 1 p.m., M.S.T. 59 m.p.h., with gusts to 69 m.p.h.
Kansas, cen- tral por- tion	18	Early evening				Sev- er- al			Wind and blowing dust	Southerly winds of 30 to 45 m.p.h., with gusts as high as 65 m.p.h., early in evening in some localities picked up considerable soil; erosion damage greatest in central part of State. Several automobile accidents attributed to low visibilities of 0 to 1/8 mile in the dust; road blocks set up, at least in Hutchinson area, to keep traffic off highways.
Wyoming, en- tire State	18-19				1	1			Snow and wind	Heavy snow blocked all roads; some secondary roads still blocked a week later. 1 person killed in a traffic accident which was a direct result of drifting snow on highways. All bus and highway travel interrupted.
Colorado	19-20	5 a.m., 19th- 7 p.m., 20th			9		20,000	\$25,000	do	Fresh to strong winds, reaching gale force at some points, and light to heavy snows. Conditions more severe over northeast portion. Drifting snows caused greatest damage. Roads blocked, motorists marooned, country schools closed, and visibility reduced to near zero over many localities. Transmission lines, signs, trees, small buildings, and winter grains suffered. Some livestock losses and shrinkage.
Iowa, north- western portion	19-20	All day			2				Snow and blizzard	Heavy snow effectually halted all traffic northwest of a line from Denison to Britt. Snow drifted by strong winds to depths of 10 feet. Blizzard conditions afternoon and evening of 20th, with sub-zero temperatures by morning of 21st. Many cars along highways abandoned by stranded motorists. Schools closed. 2 persons died from over-exertion while shoveling snow.
South Dakota, over State	19-20				4				Blizzard	7 to 20 inches of snow fell in south and east and 1 to 3 inches elsewhere. 1 person lost her life as a direct cause of storm and 3 others died of heart attacks while performing duties during storm. Schools closed on 20th. Business conferences, social events, and basketball tournaments cancelled. One-way traffic allowable on some main roads shortly after discontinuance of storm. Bus, truck, and plane transportation back on schedule by evening of 21st.
Pearson Chapel, Pine Hill, Hope- well, and Davy Croc- ett Nation- al Forest, Houston County, Tex.	19	Afternoon			0	0	40,000		Tornado	Damaged homes, and blew down trees in Crockett National Forest.
Weches, Houston County, Tex.	19	Afternoon							Hail	Power and telephone lines damaged.
Nat (near Nacogdoches), Nacogdoches County, Tex.	19	5:30 p.m.			0	0			Tornado	10 homes, a church, several barns, and power lines damaged.
Lindsay (7 miles south of), Garvin County, Okla.	19	7:40 p.m.	17	1-1/4	0	0	1,000		0 Tornado, rain, and electri- cal	Several outbuildings on 1 farmstead damaged. Twisting and lifting effects evident. A witness reported "Rain, thunder, and lightning came about 7:30 p.m. —wind came like a freight train about 10 minutes later and lasted between 5 and 10 minutes. Then it got very quiet, but continued to rain, then hail, then stopped". Path northeastward.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

FEBRUARY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Loves Valley community (8 miles southeast of Marietta), Love County, Okla.	19	9-9:15 p.m.	440	1/2	0	0	\$2,000	\$ 0	Tornado, rain, and electrical	1 barn and 1 garage badly damaged, also damage to 2 houses. Accompanied by rain, thunder, and lightning. Path northeastward.
Sulphur (3 miles south to 3 miles east of), Murray County, Okla.	19	9:15-9:35 p.m.	67	4	0	0	1,000	0	do	Path northeastward. 2 places 4 miles apart struck. Funnel observed. Intermittent sheet lightning; light rain.
Willis (1/2 mile south and 1 mile east of), Marshall County, Okla.	19	9:45 p.m.			0	0	500	0	Tornado	Farm outbuildings on 2 adjacent farmsteads damaged.
Coalgate (southern edge of), Coal County, Okla.	19	9:50 p.m.	200	1	0	0	3,000	0	Tornado, rain, and hail	Path northeastward. Accompanied by rain and hail. Minor damage by hail to roofs and signs. Several buildings damaged. At least 10 insurance claims for damages. Funnel reported observed aloft.
Minnesota, central and southern counties	19-21				1				Sleet, snow, wind, and cold wave	Traffic of all kinds seriously delayed as heavy snows drifted badly by strong winds. Highways and roads blocked throughout most of area from vicinity of St. Cloud southwestward to Worthington. In this region, snowfall heaviest and drifted the worst. Many automobiles and a number of trains stalled by huge drifts; many travelers stranded. Automobile traffic effectually halted in some central and extreme southwestern counties by noon of 20th, as blowing snow reduced visibility to zero at times, and clearing of snow on highways had to be abandoned temporarily. Many schools closed and some business firms suspended. Some communities isolated in central and southwestern counties, where storm assumed blizzard proportions and became worst of winter.
Nebraska, western and northern portions	20	All day			1		Several thousand		Blizzard	One person frozen to death in stalled car. Widespread damage to telephone and electric light wires. All roads blocked over northern portion of State.
Kansas, western half	20	Morning							Wind, blowing dust, and blowing snow	Blowing dust mixed with blowing and drifting snow in northwest counties resulted from 45 to 55 m.p.h. northwest winds over western half of State. Visibility low over entire area and down to 0 in many localities in northern 2 tiers of counties from Phillips County westward; many schools closed, traffic practically halted, and communication lines out temporarily in some localities.
El Dorado, Ark.	20	9 a.m.					175,000		Electrical	Oil storage tank belonging to Lion Oil Co. ignited by lightning; resultant fire destroyed oil, tank, and accessories.
Hazen, Ark.	20	10:15 a.m.	35		0	0	1,000	0	Tornado	A definite funnel-shaped cloud moving northeastward dipped to ground briefly in southeastern part of town. Principal damage to roofs and small buildings. Some trees uprooted.
Washington County, Miss.	20	11 a.m.	100	1	0	2	25,000		do	Destroyed homes in Glen Allen.
Carroll and Grenada Counties, Miss.	20	Noon	100	15	0	0	20,000		do	Moved northeastward from near Carrollton to Elliott.
Grant Parish, La.	20	12:05 p.m.	300	1			3,250		Thunder-squall	Several buildings damaged at Stuart forest nursery near Pollock and Bently. Weather Bureau shelter blown down and broken apart.
Chickasaw County, Miss.	20	3 p.m.					3,000		do	Destroyed 1 home and damaged several in Houliks.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

FEBRUARY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Phil Campbell, Franklin County, Ala.	20	4 p.m.					\$5,000		Electrical	Lightning struck a residence, burning house and contents.
Wheeler Mountain Community (5 miles southwest of Tuscomb), Colbert County, Ala.	20	4:10 p.m.	17	**100	1	8	20,000	\$ 0	Tornado	1 residence destroyed and 6 damaged; 4 other buildings destroyed and 7 damaged.
Winfield (near), Marion County, Ala.	20	4:30 p.m.	300	1/2	0	2	17,000	0	do	7 residences destroyed and 5 damaged; 11 other buildings destroyed and 2 damaged.
Macedonia Community (about 10 miles north-northwest of Jasper), Walker County, Ala.	20	4:45 p.m.	100	3/4	0	1	33,000	0	do	5 residences destroyed and 2 damaged; 24 other buildings destroyed and 3 damaged.
Vina (near), Franklin County, Ala.	20	7 p.m.	220	6 to 8	0	6	25,000	0	do	10 residences destroyed and 39 damaged; 30 other buildings destroyed and 46 damaged.
Wisconsin, northwest-ern portion	20-21				0				Snow	6 to 10 inches of snow fell. More than 50 schools closed in Chippewa Falls and Eau Claire areas. Additional schools closed in and near Ashland and Superior. Strong winds caused much drifting, hampering highway travel.
New England	21	All day			1	Many	5,000		Wind	Southwest windstorm of whole gale velocity occurred over New England, causing widespread damage to trees and power lines; many windows broken, and a number of suspension signs blown down. In Lawrence, Mass., a six-story fire wall toppled and bricks cascaded down upon a restaurant, breaking an outside water tank. Death caused by auto accident indirectly attributed to storm. Injuries due to various accidents, directly or indirectly attributed to wind.
New York, western and central portions	21								do	Winds with gusts of more than 80 m.p.h. sent Niagara River out of its banks over shores of Lake Erie from Silver Creek to North Tonawanda and flooded basements, streets, and highways. Trees, wires, and poles blown down in much of western half of state. Many buildings unroofed. Large barn destroyed at Penn Yan, with loss estimated at \$18,000. Total damage unestimated, but extensive.
North Carolina, mountain sections	21						9,900		Rain and wind	Rainy, windy weather over state, with heaviest in mountains. Estimated damage is that due to flooding on mountain streams.
California, San Francisco Bay area to Monterey Bay	23								Winds	Low pressure center over southern California and high pressure center over Pacific Northwest resulted in strong northerly to northeasterly winds in San Francisco Bay and Monterey Bay areas. Force of wind downed trees and power lines, beached boats, wrecked plate-glass windows, overturned light airplanes, and generally played havoc with television antennae, roofs, garbage cans, etc. Fastest mile of wind reported as 40 m.p.h. from north at San Francisco International Airport, 49 m.p.h. from north at Oakland Airport, and 42 m.p.h. from north-northwest at Sacramento Airport.
Wyoming, northern portion	Feb. 28-Mar. 1				4				Snow and wind	4 persons killed in traffic accidents caused by storm. All flying suspended and rain and highway traffic seriously curtailed. Some damage to telephone lines.

See footnotes at end of table.

# SEVERE STORMS

Table 4--Continued

FEBRUARY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		

## DELAYED REPORT:

Wilkes-Barre area, Pa.	Jan. 25	Daytime							Rain	Rains of January 23 and 24 sent creeks over their banks locally, blocked some streets, and flooded some basements in low areas. Inflow of water to Harvey's Lake sent level above some boat landings.
---------------------------	------------	---------	--	--	--	--	--	--	------	---

## CORRECTION:

Issaquena, Sharkey and Humphreys Counties, Miss.	Jan. 22	11-11:45 p.m.	100	38	0	1	\$110,000		Tornado	Developed in Issaquena County where 1 person injured, moved through Delta National Forest in Sharkey County to Louise, Midnight, and Silver City in Humphreys County.
--	------------	------------------	-----	----	---	---	-----------	--	---------	---

- Miles instead of yards.
- Yards instead of miles.
- ° Crop damage included with other property damage.



# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

FEBRUARY 1953

There was no major flooding during February. The greatest damage reported was in the Pearl River Basin. Three lives were lost in the Ohio Basin in the Greenbrier and East Rivers in West Virginia. The highest discharge in 20 years was reported near Iowa City, Iowa, from the Rapid Creek watershed.

**ATLANTIC SLOPE.**—The flooding on the Susquehanna and Chenango Rivers in New York was due to snow-melt as the precipitation from the 21st to 23d averaged only 0.1 inch. No damage resulted from the slight overflows.

The heavy rains (1.5 inches) on the 20th and 21st caused flooding on the James and Jackson Rivers in Virginia between the 21st and 24th. The runoff was high as the ground was saturated from the precipitation on the 6th, 7th, 14th and 15th. No material damage resulted from the high water. At Richmond, Va. some oil docks were under water for several hours and barging operations at and below Richmond were interrupted.

The flooding on the Neuse and Cape Fear Rivers was due to rainfall on the 6-7th and 15-16th which averaged 1 and 1.5 inches respectively. The additional rainfall on the 21st and 22d which averaged 1 inch helped to prolong the overflows in the lower portion of the Neuse and Cape Fear Rivers. The flooding on the Roanoke River at Williamston, N. C. was due to rainfall during the latter part of January. The high water resulted in delays in river traffic on the Cape Fear River. No damage was reported.

Successive rains during the month caused the Edisto River, in South Carolina, which is slow to flood, to rise to above bankfull stage by the end of the month. These heavy rains caused a minor flash flood on the Yadkin River at Wilkesboro, N. C. on the 21st. There were three sharp rises on the Pee Dee River at Cheraw, S. C. with two successive crests well above flood stage, less than a week apart. The lower Pee Dee began flooding at Pee Dee, S. C. on the 18th and continued in flood until March 11.

The heavy rains (3.2 inches) on the 20-21st caused minor flooding in the headwaters of the Saluda and Broad Rivers in South Carolina, between the 21st and 24th. No damages were reported.

Excessive rains (3.2 inches) occurred in the upper portion of the Savannah River drainage in Georgia between the 19th and 21st, causing light flooding on the North Broad at Carlton, Ga. on the 22d. This same storm caused light flooding on the Ogeechee River at Dover, Ga. The rainfall over this basin was considerably lighter and averaged 1.3 inches. The Altamaha River at Charlotte, Ga. was still rising at the end of the month.

**EAST GULF OF MEXICO DRAINAGE.**—Heavy rainfall of 2-4 inches during the period of the 20-26th resulted in moderate to strong rises in the middle and lower portions of the Apalachicola River system. However, flood stage was reached only at Blountstown, Fla. on the Apalachicola River.

This same storm caused flooding on the upper Coosa and lower Alabama Rivers in Alabama. Some losses resulted in rural areas and include damages to agriculture, public roads, and railroads. No material urban damages were reported.

The heavy rain (1 inch) on the 15th caused the Warrior and Tombigbee Rivers to rise moderately to above flood stage in the lower portions. Additional heavy rain (3 inches) on the 24th and 25th prolonged the flooding. Flood losses were held to

a minimum by advance warnings. It was too early in the season to affect lowland crops and, as winter floods are expected in that area, only movable equipment is used in the flood plain. The Tombigbee River at Columbus, Miss., came near to but did not pass the critical point where it becomes necessary to evacuate approximately 2,000 families from new housing developments near the river.

The flooding on the Pascagoula and Pearl Rivers and tributaries in Mississippi and Louisiana was due to excessive precipitation between the 19th and 25th. The heaviest precipitation occurred over the Pearl River producing flood stages from the extreme headwaters to the coast during the greater part of the last week of February. There were three periods of rainy weather before the 19th which conditioned the river basins for the rather rapid runoff which occurred. The damages on the Pearl River amounted to \$175,000. Damages elsewhere were minor.

**Upper Mississippi Basin.**—The moderate flooding on the Pecatonica River at Freeport, Ill. between the 23d and 26th was due to heavy precipitation (1.25 inches on 19-20th) of short duration accompanied by ice breakup. The runoff was quite rapid because of the frozen or nearly saturated surface soil. Moderate damages resulted from the severe flooding in the business section of Darlington, Wis. and from the overflows at Freeport, Ill.

Minor flooding occurred along the tributaries of the main streams in Iowa on the 20th and 21st. The rains began in western Iowa on the 19th, spreading into eastern Iowa and continued until about noon on the 20th. The rains were light in western and north-central Iowa, moderate in south-central Iowa and heavy in eastern Iowa. Small streams in south-central and east-central sections of the State rose rapidly and overflowed their banks in scattered locations. Local ice jams aggravated the flooding. Flooding receded almost as rapidly as it started with the onset of cold weather on the 21st. The U. S. Geological Survey reported the highest discharge in 20 years of record from the Rapid Creek watershed near Iowa City. There was some inconvenience to motorists due to flooding of highways but no damage was reported. There was very little ice left in the rivers of southern Iowa by the end of the month.

**Ohio Basin.**—Minor flooding occurred on the 21st and 22d on the Greenbrier River and on the lower reaches of two creeks which flow into the Greenbrier River near Marlinton, W. Va. This flooding was due to warm rain falling upon the snow covered mountains in southern W. Va. This was the first flood on the Greenbrier River since 1936 when the river at Renick reached a stage of 18.3 ft. This was 0.1 ft. higher than the 18.2 ft. stage reached at the same point during this flood. Three persons lost their lives in this flood, one in the Greenbrier River and two in the East River between Bluefield, W. Va. and Glen Lyn, Va. The major damage was due to soil erosion.

Moderate to locally heavy rain over the Tennessee River Basin on the 11-12th caused minor flooding on the Duck River at Shelbyville, Tenn., the Elk River at Fayetteville, Tenn. and on the Tennessee River at Florence and Whitesburg, Ala. between the 12th and 15th. The rainfall averaged 1.85 inches over the drainage area above Chattanooga, Tenn. and 2.84 inches below. Another general rain on the 21st and 22d which averaged 2.2 inches above

## GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS—Continued

FEBRUARY 1953

Chattanooga and 2.3 inches below caused minor floods again along the Tennessee at Florence and Whitesburg, Ala., the Tuckasegee River at Bryson City, N. C. and First Creek in Knoxville, Tenn. No damages were reported.

Red Basin.—The flooding on the Sulphur River in Texas was due to heavy precipitation on Jan. 30th and 31st. Little or no damage resulted from this overflow.

WEST GULF OF MEXICO.—The flooding on the Lower

Sabine at Bon Wier, Tex. on the 25th and 26th was due to heavy precipitation between the 19--26th. Nearly half of the total rainfall for the month occurred during that period. Flood losses were negligible.

Columbia Basin.—There were two freshets in the Columbia Basin during February. Both of them were due to prolonged wet weather. There was no damage outside of erosion.



# FLOOD STAGE DATA

(All dates in February unless otherwise specified)

Table 5

FEBRUARY 1953

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
Tioughnoga: Whitney Point, N. Y.	12	21	23	13.3	21
Chenango: Sherburne, N. Y.	8	21	22	9.0	21
Susquehanna: Oneonta, N. Y.	12	21	23	14.1	22
James:					
Covington, Va.	7	21	22	11.3	21
Buchanan, Va.	17	22	22	19.0	22
Bremo Bluff, Va.	19	22	23	23.4	23
Columbia, Va.	18	22	23	23.4	23
State Farm, Va.	12	23	24	15.5	23-24
Richmond, Va.	8	24	24	9.1	24
Roanoke: Williamston, N. C.	10	Jan. 28	3	10.8	1
Neuse:					
Neuse, N. C.	14	15	19	16.8°	18
Smithfield, N. C.	13	15	21	17.6°	18
Goldsboro, N. C.	14	Jan. 29 18	2 Mar. 1	15.1° 17.5°	1 23
Kinston, N. C.	14	23	Mar. 2	15.4°	26
Cape Fear:					
Moncure, N. C.	20	15	17	21.3	16
Fayetteville, N. C.	35	15	18	39.7°	17
Lock No. 2, Elizabethtown, N. C.	20	15 22	21 26	29.7 26.3	18 24
Yadkin: Wilkesboro, N. C.	14	21	21	15.2	21
Pee Dee:					
Cheraw, S. C.	30	16 22	18 25	34.5 36.0 <sup>H</sup>	16 22
Pee Dee, S. C.	19	18	Mar. 11	23.6 <sup>H</sup>	28
Saluda: Pelzer, S. C.	6	21	24	10.0	22
Broad:					
Gaffney, S. C.	10	22	22	10.2	22
Blairs, S. C.	14	21	24	20.0	22
Edisto: Orangeburg, S. C.	8	27	Mar. 1	8.2 <sup>H</sup>	27
Broad: Carlton, Ga.	15	22	22	15.5	22
Ogeechee: Dover, Ga.	7	26	**	7.8	28
Altamaha: Charlotte, Ga.	12	22	**		
EAST GULF OF MEXICO DRAINAGE					
Apalachicola: Blountstown, Fla.	15	18 23	20 **	15.4 19.6	19 Mar. 2-3
Coosa: Gadsden, Ala.	20	23	24	21.0	24
Alabama:					
Millers Ferry, Ala.	40	25	**	45.0	28
Claiborne, Ala.	40	26	**		
Black Warrior:					
Tuscaloosa Lock & Dam, Ala.	47	22	23	51.9	22
Tombigbee:					
Aberdeen, Miss.	34	22	27	38.6	23
Columbus, Miss.	29	24	28	30.6	26
Gainesville, Ala.	36	23	Mar. 8	45.3	Mar. 3
Lock No. 4, Demopolis, Ala.	39	18	Mar. 11	55.2	Mar. 2-3
Lock No. 3, Whitefield, Ala.	33	16	**		
Lock No. 2, Pennington, Ala.	46	21	**		
Lock No. 1, Selitpa, Ala.	31	20	**		
Chickasawhay: Enterprise, Miss.	20	25	27	20.8	27
Pearl:					
Edinburg, Miss.	20	23	**	23.0	26
Jackson, Miss.	18	15	**	29.5	Mar. 2
Monticello, Miss.	15	21	**	20.5	27-28
Columbia, Miss.	17	25	**	19.5	Mar. 1
Bogalusa, La.	15	14	**	19.3	Mar. 4
Pearl River, La.	12	18	**	15.4	Mar. 2-3
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Pecatonica: Freeport, Ill.	14	23	26	15.0	24
Des Moines: Eddyville, Iowa	15	21	21	15.8	21

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM (Cont'd.)					
<u>Ohio Basin</u>					
Greenbrier: Renick, W. Va.	17	21	21	18.2	21
Tuckasegee: Bryson City, N. C.	9	21	21	9.4	21
Elk: Fayetteville, Tenn.	659	12	13	661.7	12
		21	21	661.0	21
Duck: Shelbyville, Tenn.	21	12	12	21.3	12
U. S. G. S. Gage (near) USWB Gage	719	12	12	720.4	12
South Chickamauga Creek: Chickamauga (nr), Tenn.	10	12	12	10.2	12
		16	16	20.3	16
		21	23	14.6	22
Tennessee: Knoxville, Tenn.	5	21	21	6.2	21
Fifth Avenue Mineral Springs	6	21	21	6.1	21
Florence, Ala.	419	12	13	419.4	12
		21	22	419.3	21
		23	25	419.4	24
Whitesburg, Ala.	560	13	15	560.4	14
		21	26	563.8	24
<u>Red Basin</u>					
Sulphur: Naples, Tex.	22	3	8	26.8	4
McCartney Bridge, Tex.	20			24.7	9
<u>Lower Mississippi Basin</u>					
Coldwater: Sarah, Miss.	18	11	12	19.4	11
WEST GULF OF MEXICO DRAINAGE					
Sabine: Bon Weir, Tex.	17	25	26	17.1	25
PACIFIC SLOPE DRAINAGE					
<u>Columbia Basin</u>					
McKenzie: Leaburg, Oreg.	12	2	8	16.1	2
Santiam: Jefferson, Oreg.	13	17	17	16.1	3
Willamette:					
Harrisburg, Oreg.	12	3	8	14.9	4
Corvallis, Oreg.	20	7	8	20.5	7
Albany, Oreg.	20	5	5	20.4	5
Oregon City, Oreg.	12	7	10	12.6	8
<u>Miscellaneous Basins</u>					
Green: Auburn, Wash.	63	Jan. 31	1	64.7	1
Snohomish: Snohomish, Wash.	23.6	Jan. 31	4	28.2	1
Snoqualmie: Carnation, Wash.	51.5	Jan. 31	2	56.4	1
		3	3	51.6	3

\* Provisional

\*\* Continued at end of month

° Highest stage reported but not necessarily the crest

# Estimated

# RADIOSONDE DATA

Average monthly values

FEBRUARY 1953

Table 20

ALBUQUERQUE, N. MEX. ( 837 MB.)					ATLANTA, GA. ( 983 MB.)					BIG SPRING, TEX. ( 926 MB.)					BISMARCK, N. DAK. ( 956 MB.)					BOISE, IDAHO ( 920 MB.)					BROWNSVILLE, TEX. (1017 MB.)					BUFFALO, N. Y. ( 988 MB.)				
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity						
SURFACE	28	1,629	4.3	42	28	309	7.9	70	28	784	8.8	42	28	505	- 5.8	82	28	868	3.0	72	28	7	16.8	79	28	221	- 0.9	74						
1,000--	28	145			28	169			28	140			28	145			28	186			28	148	16.6	77	28	124	- 3.7							
950----	28	576			28	601	8.2	58	28	570			28	554	- 7.0	79	28	611			28	591	15.1	71	28	535	- 2.3	71						
900----	28	1,028			28	1,040	6.5	60	28	1,021	9.7	34	28	976	- 5.6	69	28	1,049	4.2	57	28	1,042	13.6	62	28	962	- 4.7	72						
850----	28	1,493			28	1,507	5.1	55	28	1,494	7.6	34	28	1,423	- 6.4	62	28	1,511	1.2	54	28	1,522	12.7	48	28	1,409	- 7.1	73						
800----	28	1,988			28	2,002	4.2	45	28	1,990	5.1	33	28	1,896	- 7.8	58	28	1,996	- 1.8	55	28	2,030	11.5	38	28	1,880	- 9.0	68						
750----	28	2,511	- 2.8	36	28	2,531	2.5	42	28	2,516	2.3	33	28	2,403	-10.2	57	28	2,510	- 5.0	53	28	2,578	9.9	32	28	2,383	-11.0	54						
700----	28	3,054	- 4.2	36	28	3,080	- 5.4	49	28	3,068	- 7.7	32	28	2,924	-12.7	54	28	3,046	- 8.0	51	28	3,138	6.6	29	28	2,905	-13.5	54						
650----	28	3,636	- 7.9	37	28	3,672	- 3.5	48	28	3,660	- 3.8	28	28	3,497	-15.8	49	28	3,625	-11.3	47	28	3,746	2.3	36	28	3,474	-16.0	52						
600----	28	4,252	-11.8	36	28	4,298	- 7.0	44	27	4,284	- 8.0		28	4,086	-19.0	45	28	4,228	-14.9	48	28	4,383	- 2.1	38	28	4,065	-19.0	52						
550----	28	4,915	-16.5		27	4,971	-11.5	43	27	4,957	-12.7		28	4,733	-23.1	45	28	4,886	-19.0	47	28	5,069	- 6.9	39	28	4,710	-22.5	51						
500----	28	5,621	-21.6	35	27	5,692	-16.5	43	27	5,675	-17.6		28	5,419	-27.9	46	28	5,584	-23.9	47	28	5,804	-12.1	41	28	5,402	-26.6	49						
450----	28	6,395	-27.3		27	6,480	-22.1	44	27	6,457	-23.2		27	6,177	-33.0	47	28	6,351	-29.4	48	28	6,609	-18.1	44	28	6,159	-31.8	48						
400----	28	7,227	-33.6		27	7,331	-28.3	43	27	7,308	-29.1		27	6,990	-39.0	50	28	7,176	-35.4		28	7,470	-24.4		28	6,979	-37.3							
350----	28	8,151	-40.3		27	8,275	-35.3		27	8,248	-36.0		27	7,892	-45.8		28	8,094	-41.7		28	8,438	-31.6		28	7,890	-43.2							
300----	28	9,188	-46.8		27	9,330	-43.4		27	9,300	-43.7		27	8,903	-52.1		28	9,121	-49.0		28	9,499	-39.6		27	8,918	-49.0							
250----	28	10,380	-52.5		27	10,533	-51.6		25	10,498	-51.4		27	10,071	-55.5		28	10,299	-55.8		27	10,717	-49.2		27	10,103	-52.4							
200----	28	11,813	-54.2		27	11,967	-54.8		25	11,932	-54.4		27	11,494	-54.2		27	11,704	-57.5		27	12,153	-56.2		25	11,532	-53.1							
175----	27	12,668	-54.3		27	12,818	-56.5		25	12,787	-54.9		27	12,353	-52.7		27	12,551	-56.1		26	12,997	-58.3		22	12,381	-51.9							
150----	27	13,650	-57.1		27	13,786	-60.5		25	13,763	-58.2		26	13,342	-53.1		26	13,527	-56.7		26	13,956	-62.4		20	13,369	-52.4							
125----	26	14,798	-60.6		26	14,905	-64.6		24	14,900	-61.8		26	14,513	-54.3		24	14,668	-58.4		24	15,072	-67.2		17	14,525	-54.9							
100----	25	16,178	-64.4		25	16,252	-67.9		20	16,266	-65.1		25	15,934	-56.6		20	16,064	-60.3		23	16,398	-72.7		15	15,941	-57.3							
75----	23	17,537	-65.1		19	17,574	-69.4		19	17,615	-66.3		23	17,343	-57.4		16	17,445	-59.8		17	17,688	-74.2		13	17,346	-58.9							
50----	16	19,286	-65.3		12	19,291	-69.9		12	19,292	-65.2		21	18,153	-58.8		13	19,240	-60.5		18	19,379	-69.7		10	19,129	-59.1							
40----	9	20,403	-63.1		11	20,394	-64.5		11	20,459	-64.9		18	20,305	-58.9		11	20,377	-60.9		8	20,468	-65.2		5	20,271	-60.2							
30----					9	21,770	-61.5						9	21,711	-58.5		7	21,779	-60.1		6	21,844	-58.5		5	21,645	-60.6							

BURRWOOD, LA. (1019 MB.)					CARIBOU, MAINE ( 987 MB.)					CHARLESTON, S. C. (1018 MB.)					COLUMBIA, MO. ( 988 MB.)					DODGE CITY, KANS. ( 924 MB.)					EL PASO, TEX. ( 881 MB.)					ELT, NEV. ( 810 MB.)				
SURFACE	28	3	15.1	84	28	191	- 7.7	73	28	13	10.3	82	28	238	3.7	62	28	792	3.4	49	28	1,195	10.5	27	28	1,908	- 0.9	53						
1,000--	28	160	15.0	78	28	87			28	165	12.3	69	28	140			28	140			28	120			28	183								
950----	28	598	13.4	73	28	490	- 8.3	68	28	599	10.9	62	28	564	3.9	55	28	567			28	561			28	611								
900----	28	1,047	12.0	66	28	905	-10.1	70	28	1,043	8.6	60	28	997	1.7	54	28	1,009	5.4	39	28	1,016			28	1,054								
850----	28	1,525	10.6	54	28	1,344	-11.5	68	28	1,514	6.7	54	28	1,455	- 8	52	28	1,473	2.6	41	28	1,492	10.4	23	28	1,516								
800----	28	2,028	8.7	49	28	1,808	-12.7	65	28	2,010	5.4	41	28	1,937	- 3.2	52	28	1,961	- 0	40	28	1,993	6.7	26	28	2,006	- 1.2	44						
750----	28	2,564	6.4	45	28	2,305	-14.0	61	28	2,546	3.6	39	28	2,452	- 5.4	52	28	2,478	- 2.9	43	28	2,522	2.8	28	28	2,530	- 1.9	44						
700----	28	3,123	3.6	37	28	2,821	-15.9	61	28	3,093	- 8	41	28	2,985	- 8.0	50	28	3,018	- 6.0	45	28	3,073	- 7	28	28	3,067	- 6.0	48						
650----	28	3,724	- 3.7	37	28	3,382	-18.5	59	28	3,691	- 2.6	41	28	3,568	-11.1	47	28	3,601	- 9.6	43	28	3,664	- 4.4		28	3,651	- 9.5	51						
600----	28	4,358	- 3.7	39	28	3,969	-21.4	55	28	4,315	- 6.2	40	28	4,169	-14.4	43	28	4,209	-13.2	39	28	4,287	- 8.3		28	4,257	-13.0	50						
550----	28	5,041	- 8.5	34	28	4,611	-25.2	51	28	4,995	-10.3	38	28	4,826	-18.5	38	28	4,871	-17.4	35	28	4,955	-12.7		28	4,920	-17.1	44						
500----	28	5,772	-13.2		28	5,293	-29.2	49	28	5,718	-15.2	44	28	5,528	-23.0		28	5,574	-22.3		28	5,676	-18.0		28	5,624	-21.8	41						
450----	28	6,576	-19.0		28	6,047	-34.0	45	28	6,511	-20.8	46	28	6,301	-28.0		28	6,345	-27.9	32	28	6,460	-23.8		28	6,398	-27.5	41						
400----	28	7,431	-25.4		28	6,855	-39.1		28	7,366	-27.2	43	28	7,129	-33.6		28	7,174	-34.4		28	7,304	-30.1		28	7,227	-33.7	36						
350----	28	8,385	-32.6		27	7,759	-44.3		28	8,313	-34.1	39	28	8,052	-39.9		28	8,095	-40.5		28	8,240	-36.9		28	8,148	-40.7							
300----	28	9,451	-40.6		27	8,771	-49.8		28	9,373	-42.4	42	28	9,088	-47.0		28	9,130	-46.9		28	9,289	-44.1		28	9,179	-48.2							
250----	28	10,667	-49.1		27	9,956	-51.5		27	10,575	-51.0		28	10,275	-53.8		27	10,321	-52.9		28	10,489	-51.6		28	10,360	-54.6							
200----	28	12,108	-54.9		27	11,400	-51.3		27	12,008	-55.0		27	11,705	-54.9		26	1																



# RADIOSONDE DATA

Average monthly values

Table 20--Continued

FEBRUARY 1963

	JOLIET, ILL. ( 994 MB.)				LAKE CHARLES, LA. (1019 MB.)				LANDER, WYO. ( 828 MB.)				LAS VEGAS, NEV. ( 940 MB.)				LITTLE ROCK, ARK. (1009 MB.)				MAZATLAN, MEXICO (1011 MB.)				MEDFORD, ORE. ( 977 MB.)				
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	
SURFACE	28	179	- 1.4	74	28	5	11.9	83	28	1,696	- 3.9	63	28	660	9.5	23	28	79	7.6	70	28	14	21.3	76	28	401	6.1	83	
1,000	28	130	- 5.6		28	159	-12.1	75	28	172			28	142			28	154	8.4	62	28	111	20.9	69	28	211			
950	28	543	- 1.4	63	28	595	-11.0	70	28	593			28	578			28	580	7.5	54	28	573	21.9	37	28	639	7.3	65	
900	28	970	- 3.1	83	28	1,039	-9.6	62	28	1,031			28	1,026	11.9	19	28	1,022	5.0	54	28	1,024	19.9	34	28	1,077	5.2	64	
850	28	1,422	- 4.3	61	28	1,513	-8.7	56	28	1,484			28	1,501	8.6	21	28	1,487	3.3	46	28	1,513	17.0	29	28	1,541	2.4	65	
800	28	1,899	- 5.6	55	28	2,013	-7.2	55	28	1,966	- 1.4	50	28	1,998	4.8	23	28	1,977	2.0	42	28	2,027	14.0		28	2,029	-1	58	
750	28	2,406	- 7.7	55	28	2,549	-5.1	53	28	2,481	- 4.1	49	28	2,526	-9	28	28	2,500	-	2	41	28	2,578	10.6		28	2,548	-2.3	49
700	28	2,936	-10.8	53	28	3,103	-2.3	49	28	3,018	- 7.7	51	28	3,071	- 3.1	31	28	3,045	- 2.5	36	28	3,139	-7.1		28	3,089	-5.2	44	
650	28	3,509	-13.9	47	28	3,700	-1.2	47	28	3,596	-11.4	52	28	3,658	- 7.0	33	28	3,635	- 5.1	37	26	3,741	-2.6		28	3,675	-8.3	43	
600	27	4,106	-17.3	47	28	4,333	- 5.4	43	28	4,200	-14.7	48	28	4,273	-10.5		28	4,256	- 8.6	35	26	4,383	- 1.9		28	4,284	-12.0	45	
550	27	4,755	-21.5	43	28	5,012	- 9.8	39	28	4,858	-18.7	43	26	4,938	-14.7		28	4,926	-12.9		26	5,068	- 6.9		28	4,949	-16.0	42	
500	27	5,449	-25.8		28	5,739	-14.6		28	5,558	-23.2	40	26	5,654	-20.0		28	5,645	-17.6		26	5,807	-11.6		28	5,656	-20.6	42	
450	26	6,202	-31.0		28	6,531	-20.5		27	6,326	-28.9	40	24	6,437	-25.6		28	6,431	-23.2		26	6,608	-16.9		28	6,434	-26.1	41	
400	26	7,025	-36.8		28	7,390	-26.6		26	7,159	-34.7	39	24	7,278	-32.4		28	7,277	-29.4		26	7,480	-23.0	35	28	7,270	-31.9	41	
350	26	7,937	-42.8		28	8,339	-33.7	41	26	8,077	-41.7		22	8,200	-40.0		28	8,216	-36.5		26	8,445	-30.0		28	8,199	-38.9		
300	25	8,966	-48.7		28	9,401	-41.8		25	9,107	-49.3		19	9,231	-47.3		28	9,267	-44.2		26	9,524	-38.1		28	9,238	-46.8		
250	23	10,153	-52.4		28	10,611	-50.2		23	10,287	-55.3		16	10,395	-54.1		27	10,464	-52.2		26	10,753	-47.4		28	10,421	-55.6		
200	22	11,581	-53.4		27	12,055	-55.0		23	11,699	-56.4		15	11,805	-55.8		26	11,895	-54.7		26	12,199	-56.3		28	11,821	-60.2		
175	22	12,440	-53.0		27	12,904	-56.6		23	12,551	-54.3		15	12,655	-55.4		25	12,742	-55.8		26	13,044	-60.3		28	12,657	-58.1		
150	19	13,440	-54.0		27	13,872	-60.6		23	13,537	-55.0		14	13,626	-56.4		25	13,718	-58.3		26	14,095	-64.0		28	13,634	-58.2		
125	17	14,589	-55.6		26	14,995	-65.2		26	14,705	-56.4		12	14,753	-58.2		23	14,857	-61.4		26	15,102	-68.4		23	14,778	-60.3		
100	15	16,005	-58.6		25	16,336	-69.6		21	16,114	-58.9		10	16,161	-62.3		21	16,235	-64.4		8	16,421	-73.1		19	16,160	-62.1		
80	11	17,382	-59.6		20	17,651	-70.7		15	17,507	-59.7		7	17,505	-63.6		19	17,585	-65.0		7	17,724	-76.7		17	17,535	-62.8		
60	9	19,182	-60.1		11	19,330	-69.0		6	19,296	-59.7		5	19,245	-61.7		11	19,353	-64.5		8	20,456	-63.8		13	19,299	-62.4		
50	8	20,325	-60.2		8	21,809	-65.5		5	20,443	-65.5		5	21,838	-60.2		8	20,456	-63.8		5	21,838	-60.2		11	20,418	-61.0		
40					9	21,809	-62.0																		8	21,806	-59.9		

	MERIDA, MEXICO (1014 MB.)				MIAMI, FLA. (1019 MB.)				NANTUCKET, MASS. (1013 MB.)				NASHVILLE, TENN. ( 998 MB.)				NORTH PLATTE, NEBR. ( 916 MB.)				OAKLAND, CALIF. (1022 MB.)				OKLAHOMA CITY, OKLA. ( 971 MB.)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	26	27	24.5	59	28	4	20.8	77	28	14	1.6	82	28	177	6.5	74	28	849	- 2.0	76	28	6	11.9	89	28	391	5.8	61
1,000	26	145	23.9	69	28	169	20.4	73	28	120	2.3	71	28	160	5.6		28	140			28	185	12.0	59	28	150		
950	26	593	21.3	69	28	612	17.5	72	28	536	1.0	64	28	581	6.4	59	28	553			28	617	11.3	43	28	576	7.7	50
900	26	1,060	19.0	64	28	1,071	14.4	70	28	966	- 1.5	61	28	1,023	3.5	58	28	988	-5	65	28	1,064	9.3	37	28	1,017	5.5	40
850	26	1,549	16.1	62	28	1,552	12.7	57	28	1,420	- 3.8	60	28	1,485	1.8	53	28	1,445	- 1.2	57	28	1,535	7.4	31	28	1,482	3.1	45
800	26	2,062	13.4	57	28	2,059	11.0	46	28	1,897	- 5.9	58	28	1,972	-2	51	28	1,927	-2.4	50	28	2,032	5.1		28	1,972	1.0	45
750	26	2,608	10.8		28	2,600	8.4	34	28	2,408	- 7.2	49	28	2,493	- 1.7	44	28	2,440	- 5.5	47	28	2,563	2.2		28	2,494	-7	38
700	24	3,176	8.5		28	3,164	6.4		28	2,937	- 9.2	45	28	3,033	- 3.8	41	28	2,975	- 8.4	46	28	3,110	-1.0		28	3,037	-3.6	37
650	24	3,791	5.6		28	3,768	3.1		28	3,513	-11.9	42	28	3,618	- 6.4	39	28	3,552	-11.3	44	28	3,698	- 4.6		28	3,626	-7.1	35
600	24	4,436	2.0		28	4,412	- 9		28	4,116	-15.6	43	28	4,238	-10.0	37	28	4,157	-15.2	45	28	4,323	- 8.6		28	4,239	-11.0	34
550	24	5,132	- 2.0		28	5,100	- 5.2		28	4,771	-19.7	43	27	4,904	-14.2	36	28	4,807	-19.7	46	28	4,989	-13.2		28	4,905	-15.2	30
500	23	5,883	- 7.3		28	5,843	-10.0		28	5,469	-24.1	38	27	5,617	-18.9	36	28	5,510	-24.3	44	28	5,711	-18.5		28	5,615	-19.9	
450	23	6,701	-13.3		28	6,654	-16.0		28	6,235	-29.5		27	6,400	-24.6		28	6,267	-29.6	43	28	6,493	-24.2		28	6,398	-25.0	
400	23	7,582	-19.7		28	7,523	-22.6		28	7,060	-35.2		27	7,240	-30.8		28	7,100	-36.0	43	28	7,337	-30.8		28	7,235	-31.2	
350	22	8,557	-26.9		28	8,488	-29.9		27	7,985	-41.2		27	8,174	-37.6		28	8,011	-42.8		28	8,270	-38.3		28	8,167	-38.0	
300	21	9,648	-35.7		28	9,566	-38.5		27	9,018	-47.0		27	9,220	-44.8		27	9,033	-49.8		28	9,311	-46.8		28	9,211	-45.4	
250	20	10,895	-44.9		28	10,794	-47.3		27	10,217	-51.8		27	10,417	-52.5		26	10,213	-54.3		28	10,495	-55.8		28	10,404	-53.0	
200	17	12,348	-54.1		28	12,242																						

# RADIOSONDE DATA

Average monthly values

Table 20--Continued

FEBRUARY 1953

Standard pressure surface (mb.)	SAN JUAN, P. R. (1017 MB.)				SANTA MARIA, CALIF. (1012 MB.)				S. STE. MARIE, MICH. ( 985 MB.)				SPOKANE, WASH. ( 936 MB.)				SWAN ISLAND, W. I. (1015 MB.)				TACUBAYA, MEXICO ( 773 MB.)				TAMPA, FLA. (1019 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	19	23.3	78	27	71	10.6	67	28	221	- 6.3	81	27	722	1.8	80	28	10	25.2	77	27	2,306	17.6	39	28	9	16.3	84
1,000---	28	165	22.8	76	27	167	12.5	58	28	105			27	183			28	139	24.8	76	27	39			28	170	17.1	77
950----	28	609	19.5	78	27	598	12.5	41	28	508	- 7.0	75	27	603			28	590	21.5	77	27	505			28	610	15.3	70
900-----	28	1,073	16.0	80	27	1,049	10.9	30	28	926	- 9.1	75	27	1,037	- 1.3	67	28	1,055	18.3	73	27	985			28	1,065	13.1	67
850-----	28	1,558	13.5	71	27	1,524	8.5	25	28	1,366	-11.1	77	27	1,495	- 1.4	63	28	1,543	15.3	67	27	1,479			28	1,544	11.5	53
800-----	28	2,068	12.1	45	27	2,022	5.6	22	28	1,830	-12.7	74	27	1,976	- 4.1	59	28	2,055	12.3	66	27	2,013			28	2,049	9.8	47
750-----	28	2,614	11.0	34	27	2,555	2.9		28	2,325	-14.6	73	27	2,487	- 6.9	56	28	2,600	10.7	43	27	2,566	16.0	35	28	2,591	7.5	38
700-----	28	3,181	8.4		27	3,102	.1		28	2,840	-17.1	71	27	3,018	- 9.7	54	28	3,167	9.1		27	3,142	11.3	38	28	3,148	4.8	
650-----	28	3,798	5.6		27	3,696	- 3.8		28	3,399	-19.6	66	27	3,594	-12.8	51	28	3,784	6.5		27	3,762	6.2	45	28	3,751	1.8	
600-----	28	4,438	2.1		27	4,318	- 8.1		28	3,984	-22.6	61	27	4,193	-16.5	50	28	4,430	2.8		27	4,407	1.0	47	28	4,390	- 2.3	
550-----	28	5,136	- 2.0		27	4,989	-13.0		28	4,621	-26.5	55	27	4,845	-20.5	50	28	5,129	- 1.7		27	5,107	- 3.9	43	28	5,074	- 6.5	
500-----	28	5,886	- 6.7		27	5,707	-18.4		28	5,303	-29.9	48	27	5,540	-25.2	49	28	5,880	- 6.4		27	5,847	- 8.4	34	28	5,813	-11.6	
450-----	28	6,708	-12.2		27	6,491	-24.9		28	6,050	-35.0		27	6,304	-30.2	47	28	6,701	-11.9		27	6,663	-14.1		28	6,620	-17.3	
400-----	28	7,589	-18.9		27	7,328	-31.7		28	6,859	-40.1		27	7,125	-36.2	48	28	7,586	-18.6		26	7,541	-20.6		28	7,484	-23.7	
350-----	28	8,568	-26.0		27	8,257	-39.0		28	7,758	-45.8		27	8,038	-43.0		28	8,566	-25.8		26	8,514	-28.0		28	8,444	-31.1	
300-----	28	9,665	-34.3		27	9,294	-47.2		28	8,771	-50.8		27	9,060	-49.7		28	9,662	-34.4		21	9,602	-36.5		28	9,518	-39.0	
250-----	28	10,916	-43.7		27	10,478	-55.1		28	9,954	-51.6		27	10,235	-55.5		28	10,910	-43.6		16	10,835	-46.2		28	10,742	-47.8	
200-----	28	12,382	-53.9		27	11,893	-56.6		27	11,413	-50.1		27	11,644	-57.6		28	12,375	-54.0		11	12,294	-55.4		28	12,190	-54.8	
175-----	28	13,229	-59.1		27	12,740	-56.8		25	12,288	-50.2		27	12,491	-55.1		28	13,222	-58.4		11	13,141	-58.9		28	13,038	-57.7	
150-----	28	14,181	-65.3		27	13,711	-59.0		25	13,291	-51.3		27	13,474	-55.2		28	14,179	-63.7		7	14,087	-62.9		28	13,959	-62.2	
125-----	28	15,712	-72.2		27	14,844	-62.7		22	14,463	-52.9		27	14,633	-56.8		28	15,279	-70.2		5	15,204			28	15,109	-68.2	
100-----	28	16,562	-78.4		25	16,201	-65.2		22	15,892	-55.6		23	16,036	-58.0		25	16,575	-77.2						26	16,437	-73.2	
80-----	25	17,826	-80.0		22	17,560	-66.8		22	17,307	-57.0		18	17,441	-59.1		20	17,844	-79.9						24	17,735	-75.3	
60-----	18	19,482	-71.6		16	19,297	-65.4		18	19,127	-58.8		13	19,238	-59.4		16	19,501	-73.9						20	19,407	-72.4	
50-----	15	20,579	-65.3		16	20,408	-63.4		12	20,269	-58.7		7	20,372	-59.1		14	20,582	-67.8						20	20,489	-67.9	
40-----	13	21,957	-59.5		8	21,791	-60.4		9	21,669	-58.7		8	21,764	-59.3		13	21,935	-63.2						19	21,849	-61.6	
30-----	7	23,786	-53.1														12	23,735	-57.4						13	23,646	-57.1	
20-----																	11	23,328	-51.3									

TATOOSH ISLAND, WASH. (1019 MB.)				VERACRUZ, MEXICO (1012 MB.)				WASHINGTON, D. C. (1008 MB.)				
Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	
SURFACE	28	31	6.6	84	28	13	22.5	80	28	88	4.4	56
1,000---	28	184	6.1	75	28	120	21.8	80	28	150	4.5	56
950----	28	605	3.5	74	28	565	19.9	77	28	571	3.8	53
900-----	28	1,039	.8	70	28	1,030	18.4	72	28	1,005	1.9	54
850-----	28	1,497	- 1.5	67	28	1,519	16.7	61	28	1,465	- .2	52
800-----	28	1,977	- 3.9	59	28	2,034	14.1	55	28	1,948	- 2.1	50
750-----	28	2,490	- 6.4	49	28	2,582	12.0	48	28	2,464	- 4.1	49
700-----	28	3,021	- 9.3	46	28	3,152	9.1	41	28	3,000	- 6.3	49
650-----	28	3,594	-12.7	51	27	3,766	5.7	35	28	3,584	- 9.4	49
600-----	28	4,197	-16.3	49	27	4,414	2.0	31	28	4,191	-12.5	46
550-----	27	4,845	-21.0	46	27	5,108	- 2.5		28	4,853	-16.4	45
500-----	26	5,545	-25.5		23	5,858	- 7.5		28	5,561	-21.1	46
450-----	26	6,308	-30.1		23	6,675	-13.4		28	6,334	-26.6	46
400-----	26	7,131	-35.8		22	7,555	-20.0		28	7,170	-32.9	44
350-----	26	8,045	-42.3		21	8,530	-27.6		28	8,095	-39.4	
300-----	26	9,071	-49.0		20	9,621	-36.0		28	9,134	-46.2	
250-----	25	10,252	-55.7		20	10,862	-45.4		28	10,325	-52.5	
200-----	23	11,657	-57.6		17	12,313	-54.8		27	11,755	-54.2	
175-----	23	12,500	-56.8		17	13,159	-58.8		26	12,613	-54.6	
150-----	19	13,481	-57.1		17	14,117	-63.9		25	13,599	-56.5	
125-----	18	14,630	-57.4		15	15,224	-69.8		23	14,742	-59.8	
100-----	14	16,014	-58.4		11	16,507	-75.4		21	16,110	-62.1	
80-----	10	17,419	-59.7						16	17,487	-63.9	
60-----	7	19,223	-59.1						11	19,255	-62.9	
50-----	6	20,376	-59.6						10	20,378	-62.2	
40-----									9	21,756	-61.6	
30-----									6	23,542	-60.3	
20-----									6	26,094	-54.9	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and

expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.



# PILOT BALLOON DATA

Average monthly resultant winds

Table 21

FEBRUARY 1953

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed				
Surface-----	27	203	1.4	28	226	1.0	25	291	4.9	28	305	4.2	27	322	3.8	25	113	2.8	26	233	6.8	27	262	1.8	24	222	1.4	26	244	4.2	28	269	3.5	28	344	3.9
500-----	26	209	2.4	28	226	1.0	25	291	4.9	28	305	4.2	27	322	3.8	25	113	2.8	26	233	6.8	27	262	1.8	24	222	1.4	26	244	4.2	28	269	3.5	28	344	3.9
1,000-----	26	209	2.4	28	226	1.0	25	291	4.9	28	305	4.2	27	322	3.8	25	113	2.8	26	233	6.8	27	262	1.8	24	222	1.4	26	244	4.2	28	269	3.5	28	344	3.9
1,500-----	26	227	4.4	28	226	1.0	25	291	4.9	28	305	4.2	27	322	3.8	25	113	2.8	26	233	6.8	27	262	1.8	24	222	1.4	26	244	4.2	28	269	3.5	28	344	3.9
2,000-----	24	270	7.1	28	264	1.7	24	291	9.9	21	312	12.9	26	297	6.1	15	284	6.3	10	275	13.2	18	278	12.8	16	274	10.2	23	271	12.3	27	268	5.4	28	345	4.1
2,500-----	24	270	10.8	27	283	4.3	20	296	10.0	19	313	13.8	25	304	7.4	11	295	8.4	10	275	13.2	14	283	16.1	15	277	14.0	21	277	13.6	26	271	6.5	28	333	3.4
3,000-----	22	267	12.8	26	288	6.5	17	299	12.1	18	312	15.3	21	324	7.1	10	298	9.5	10	299	12.3	13	285	17.0	15	277	16.8	17	286	15.7	25	274	9.1	26	320	3.9
4,000-----	20	273	16.4	22	291	9.2	12	303	13.0	15	312	17.4	18	327	8.5	10	299	12.3	11	299	12.3	11	281	19.6	12	291	19.9	22	273	12.9	23	326	7.3	28	345	4.1
5,000-----	19	270	17.9	20	294	13.2	12	303	13.0	15	312	17.4	18	327	8.5	10	299	12.3	11	299	12.3	11	281	19.6	12	291	19.9	22	273	12.9	23	326	7.3	28	345	4.1
6,000-----	15	276	20.7	18	288	14.9	12	303	13.0	15	312	17.4	18	327	8.5	10	299	12.3	11	299	12.3	11	281	19.6	12	291	19.9	22	273	12.9	23	326	7.3	28	345	4.1
8,000-----	15	276	20.7	18	288	14.9	12	303	13.0	15	312	17.4	18	327	8.5	10	299	12.3	11	299	12.3	11	281	19.6	12	291	19.9	22	273	12.9	23	326	7.3	28	345	4.1
10,000-----	15	276	20.7	18	288	14.9	12	303	13.0	15	312	17.4	18	327	8.5	10	299	12.3	11	299	12.3	11	281	19.6	12	291	19.9	22	273	12.9	23	326	7.3	28	345	4.1

Altitude (meters) m.s.l.	Grand Junc- tion, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jackson- ville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Little Rock, Ark. (88 m.)			Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed			
Surface-----	27	295	1.9	27	267	2.7	27	272	4.4	27	270	0.4	26	249	4.2	25	181	0.8	26	317	1.8	28	124	2.3	23	356	1.3	25	249	1.5	25	298	2.3	25	238	1.8
500-----	27	295	1.9	27	267	2.7	27	272	4.4	27	270	0.4	26	249	4.2	25	181	0.8	26	317	1.8	28	124	2.3	23	356	1.3	25	249	1.5	25	298	2.3	25	238	1.8
1,000-----	27	295	1.9	27	267	2.7	27	272	4.4	27	270	0.4	26	249	4.2	25	181	0.8	26	317	1.8	28	124	2.3	23	356	1.3	25	249	1.5	25	298	2.3	25	238	1.8
1,500-----	27	296	2.0	27	267	7.0	25	275	9.9	20	247	5.2	20	268	10.9	22	243	4.0	26	247	2.0	28	180	1.6	21	308	2.5	22	244	3.6	23	348	5.9	23	234	1.9
2,000-----	27	299	2.3	20	277	10.2	22	291	11.8	18	263	7.7	18	280	14.4	19	277	7.0	17	247	2.4	24	231	4.4	12	284	8.3	20	281	8.1	23	354	9.0	21	270	6.8
2,500-----	27	277	3.2	20	281	12.7	20	296	11.8	16	269	10.0	15	282	17.5	19	270	9.8	13	15	7.2	19	253	5.8	11	281	12.2	20	276	11.5	23	348	10.1	20	270	8.9
3,000-----	26	277	4.4	20	274	15.3	17	298	13.6	15	269	12.7	13	282	19.5	18	273	11.3	13	13	9.3	18	254	7.2	20	272	13.4	23	348	10.8	19	278	11.1			
4,000-----	24	307	6.7	18	276	19.9	11	298	13.3	15	267	16.3	11	284	21.3	16	272	16.7	12	352	13.3	12	262	8.6	18	279	19.6	23	348	14.8	18	265	14.9			
5,000-----	22	307	11.9	16	277	25.5	11	298	13.3	15	267	16.3	11	284	21.3	16	272	16.7	12	352	13.3	12	262	8.6	18	279	19.6	23	348	14.8	18	265	14.9			
6,000-----	18	298	12.8	15	274	29.3	11	298	13.3	15	267	16.3	11	284	21.3	16	272	16.7	12	352	13.3	12	262	8.6	18	279	19.6	23	348	14.8	18	265	14.9			
8,000-----	15	302	13.6	15	274	29.3	11	298	13.3	15	267	16.3	11	284	21.3	16	272	16.7	12	352	13.3	12	262	8.6	18	279	19.6	23	348	14.8	18	265	14.9			
10,000-----	11	293	8.7	15	274	29.3	11	298	13.3	15	267	16.3	11	284	21.3	16	272	16.7	12	352	13.3	12	262	8.6	18	279	19.6	23	348	14.8	18	265	14.9			

Altitude (meters) m.s.l.	Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (725 m.)			* Washington, D.C. (24 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface-----	25	271	2.0	28	240	0.8	23	354	3.6	26	299	2.8	28	249	2.9	26	100	1.1	28	288	3.5	21	275	2.5	28	218	2.5	27	218	2.4	28	283	2.6
500-----	25	272	2.3	28	219	1.0	23	354	3.6	26	299	2.8	28	249	2.9	26	100	1.1	28	288	3.5	21	277	4.2	28	235	2.7	27	218	2.4	28	283	2.6
1,000-----	20	271	4.8	28	218	1.5	23	354	3.8	22	308	5.3	24	246	6.9	24	130	1.5	26	343	2.4	13	275	5.9	22	238	3.8	27	230	3.8	28	271	8.2
1,500-----	17	275	8.9	28	271	1.6	22	328	7.1	18	313	9.3	22	263	9.3	22	275	3.4	26	11	3.2	21	275	5.9	16	251	4.0	26	249	6.3	28	272	10.8
2,000-----	16	277	11.1	26	294	1.9	19	316	8.2	18	308	11.6	19	281	12.7	22	263	6.3	26	1	4.1	21	275	5.9	12	265	5.4	21	267	7.3	28	280	13.2
2,500-----	16	287	12.6	26	305	2.3	19	309	9.2	18	305	13.3	17	277	14.4	19	260	10.0	25	349	5.9	21	275	5.9	16	251	4.0	26	249	6.3	28	272	10.8
3,000-----	16	283	14.0	26	302	4.4	19	312	10.1	15	307	14.6	14	279	15.1	19	261	12.0	25	340	6.7	21	275	5.9	16	251	4.0	26	249	6.3	28	272	10.8
4,000-----	15	288	15.0	24	311	6.1	12	315	10.2	14	304	18.0	12	274	18.3	14	259	14.5	23	331	6.0	21	275	5.9	16	251	4.0	26	249	6.3	28	272	10.8
5,000-----	12	289	16.0	22	306	9.2	10	323	15.6	13	304	21.1	11	279	24.2	12	270	15.6	20	327	7.2	21	275	5.9	16	251	4.0	26	249	6.3	28	272	10.8
6,000-----	12	284	19.5	17	290	10.6	10	323	15.6	13	304	21.1	11	279	24.2	12	270	15.6	20	327	7.2	21	275	5.9	16	251	4.0	26	249	6.3	28	272	10.8
8,000-----	12	284	19.5	17	290	10.6	10	323	15.6	13	304	21.1	11	279	24.2	12	270	15.6	20	327	7.2	21	275	5.9	16	251	4.0	26	249	6.3	28	272	10.8
10,000-----	12	284	19.5	17	290	10.6	10	323	15.6	13	304																						

# RAWIN DATA Average monthly resultant winds

Table 22

FEBRUARY 1953

Altitude (meters) m.a.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed				
Surface	28	12	2.5	28	152	2.4	28	322	1.9	28	102	1.9	28	55	1.4	28	263	3.2	28	251	1.2	28	232	1.9	28	1	0.8	27	286	1.3	25	286	0.7	28	275	1.4
500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,000	---	---	---	28	172	3.4	28	317	7.4	27	162	2.1	27	222	1.9	28	277	7.2	27	260	5.5	27	253	8.5	---	---	---	27	271	4.3	25	254	3.3	28	302	2.4
1,500	---	---	---	28	233	4.8	27	317	9.4	27	229	2.8	27	244	4.6	26	285	8.7	26	263	8.0	27	268	10.4	28	360	---	27	267	6.7	25	258	5.8	28	310	5.2
2,000	28	332	5.0	28	259	8.0	27	311	10.8	27	249	4.9	26	241	7.4	26	280	9.7	24	264	10.2	27	277	12.1	28	338	1.8	27	271	10.9	23	269	10.9	28	311	8.0
2,500	28	308	6.6	28	264	9.5	27	308	12.6	27	257	6.9	26	252	8.7	26	278	10.6	24	265	12.8	26	281	12.7	28	293	2.0	25	269	13.4	22	270	13.9	28	314	9.7
3,000	28	296	8.2	28	268	11.0	27	312	14.7	26	254	9.0	25	249	10.7	26	275	11.8	24	264	15.0	26	279	14.0	28	286	2.9	24	263	16.2	19	268	16.8	28	310	11.6
4,000	28	287	10.1	27	260	14.4	26	314	16.1	26	253	12.1	25	251	15.1	25	272	15.1	20	264	18.1	25	274	17.0	28	316	6.3	19	273	17.9	13	273	18.8	28	303	14.2
5,000	28	289	11.7	25	267	18.9	22	309	16.3	27	255	15.4	24	256	17.8	25	272	16.2	17	261	18.5	25	274	20.2	27	308	8.2	17	281	19.6	10	269	25.4	26	298	15.6
6,000	26	283	13.8	19	266	20.7	17	300	14.8	26	252	18.5	23	255	21.2	25	272	17.8	14	268	19.9	21	279	20.4	27	312	10.4	12	287	24.0	---	---	---	---	---	
8,000	22	279	18.4	13	269	23.5	16	293	17.3	17	248	23.2	19	256	27.5	21	267	19.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10,000	16	268	17.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12,000	13	267	26.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
16,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
18,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
20,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
22,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Okla. City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P.R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed	
Surface	28	234	0.7	28	280	0.6	28	115	1.3	27	271	2.7	28	236	1.0	28	316	1.4	28	159	1.4	28	335	2.6	28	77	1.9	28	97	3.7	28	317	1.8	28	328	1.3
500	28	233	2.4	28	249	4.4	28	142	3.2	27	272	9.4	27	224	3.1	27	326	5.2	25	213	1.1	---	---	---	28	110	3.2	28	88	8.4	27	305	3.7	28	16	5.3
1,000	28	251	3.8	28	280	1.5	28	172	2.4	27	276	10.8	27	243	5.2	27	342	6.6	23	261	2.8	27	329	2.4	28	145	2.6	28	90	8.5	27	314	6.8	27	12	6.5
1,500	28	251	5.5	28	271	3.0	28	210	3.5	26	278	12.1	26	273	6.6	27	349	7.1	23	285	5.0	27	328	7.1	27	224	2.6	28	90	8.0	27	312	8.9	27	359	7.3
2,000	28	259	8.1	28	288	4.5	28	228	4.6	22	283	12.9	26	273	8.9	28	341	7.6	24	290	7.6	27	328	9.8	27	250	6.0	28	89	7.9	26	309	9.8	27	360	9.0
2,500	27	268	9.7	28	305	6.6	28	241	5.4	22	278	15.9	26	270	11.6	28	338	8.5	26	286	8.6	27	323	10.6	28	255	8.9	28	82	7.8	26	303	11.7	27	360	11.5
3,000	25	272	12.4	28	310	9.8	28	242	6.8	20	278	19.2	27	267	14.0	28	335	9.2	25	280	10.4	28	328	11.0	28	262	11.5	28	81	7.2	25	301	12.0	27	355	11.7
4,000	24	268	16.7	27	311	12.9	28	252	10.0	17	282	21.5	25	270	18.2	28	328	12.0	25	263	13.5	27	317	12.3	27	263	15.3	28	65	6.6	25	294	14.9	26	349	11.9
5,000	21	272	18.6	23	309	15.3	27	257	12.0	11	280	22.5	22	268	21.0	27	324	12.8	24	266	17.9	26	308	14.5	25	264	17.9	28	60	4.7	24	290	16.7	25	351	11.6
6,000	16	278	19.3	19	311	16.4	27	260	15.8	---	---	---	18	268	22.2	26	325	14.4	23	265	22.4	24	299	15.8	21	263	21.3	28	21	3.8	24	289	19.4	22	359	8.8
8,000	---	---	---	10	322	17.3	27	261	23.2	---	---	---	16	258	28.8	20	338	11.6	15	265	19.4	20	306	19.5	15	259	27.2	27	336	6.0	21	283	20.3	20	339	11.9
10,000	---	---	---	---	---	---	20	269	25.9	---	---	---	10	262	32.9	16	331	14.9	12	266	24.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12,000	---	---	---	---	---	---	18	269	31.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14,000	---	---	---	---	---	---	12	270	28.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
16,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
18,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
20,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
22,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D.C. (88 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed	
Surface	27	301	0.7	27	205	2.4	26	191	1.6	28	260	1.2
500	27	260	3.2	---	---	---	25	239	3.4	27	259	7.2
1,000	25	277	7.4	27	228	4.9	26	253	3.8	27	266	10.0
1,500	25	277	8.0	27	254	5.3	26	274	4.9	28	272	11.0
2,000	25	276	9.0	27	269	5.2	25	289	7.1	28	275	11.9
2,500	23	279	10.3	26	287	6.2	25	295	8.7	28	277	13.5
3,000	23	279	12.4	25	293	6.8	25	291	10.1	28	270	16.3
4,000	21	277	15.4	25	303	10.9	25	293	13.7	28	268	21.9
5,000	15	289	19.9	23	312	11.1	22	288	16.8	28	267	26.6
6,000	11	290	21.5	21	311	15.0	18	281	19.3	28	263	31.5
8,000	---	---	---	14	310	14.8	11	279	22.9	26	269	37.4
10,000	---	---	---	---	---	---	---	---	---	21	267	47.5
12,000	---	---	---	---	---	---	---	---</				



# SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun.

FEBRUARY 1953

Sun's zenith distance									
Date	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
TABLE MOUNTAIN, CALIF.									
Air mass									
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
Feb. 2	---	---	---	1.55	---	---	---	---	---
10	---	---	---	1.51	---	---	---	---	---
11	---	---	---	1.53	---	---	---	---	---
12	---	---	---	1.50	---	---	---	---	---
13	---	---	---	1.52	---	---	---	---	---
16	---	---	---	1.46	---	---	---	---	---
17	---	---	---	1.50	---	---	---	---	---
18	---	---	---	1.46	---	---	---	---	---
19	---	---	---	1.52	---	---	---	---	---
22	---	---	---	1.51	---	---	---	---	---
26	---	---	---	1.50	---	---	---	---	---
27	---	---	---	1.50	---	---	---	---	---
28	---	---	---	1.42	---	---	---	---	---
Aver- ages	---	---	---	1.50	---	---	---	---	---
Depar- tures	---	---	---	-.01	---	---	---	---	---
LINCOLN, NEBR.									
Air mass									
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
Feb. 6	0.85	0.98	1.15	1.29	---	---	---	---	---
7	.85	1.00	1.13	1.31	---	---	---	---	---
13	.96	1.09	1.22	---	---	---	---	---	---
16	.79	.94	1.11	---	---	---	---	---	---
17	.85	.98	---	---	---	---	---	---	---
21	1.02	1.11	1.24	1.35	1.42	1.31	---	---	---
26	.85	.94	1.09	1.24	1.36	---	---	---	---
Aver- ages	.88	1.01	1.16	1.30	1.39	1.31	---	---	---
Depar- tures	-.02	+.01	+.01	-.04	-.08	-.02	---	---	---
MADISON, WIS.									
Air mass									
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
Feb. 4	---	---	---	---	---	---	---	---	---
13	0.77	.92	1.08	1.30	---	---	---	---	---
17	.34	1.02	1.15	1.26	---	---	---	---	---
18	.49	.69	.84	1.07	---	---	---	---	---
23	.70	.86	.92	1.16	---	---	---	---	---
26	.75	.90	1.04	---	---	---	---	---	---
Aver- ages	.71	.83	.97	1.20	---	---	---	---	---
Depar- tures	-.14	-.16	-.16	-.12	---	---	---	---	---

Sun's zenith distance									
Date	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
BOSTON, MASS.									
Air mass									
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
Feb. 9	---	---	---	1.20	---	1.12	0.85	0.76	0.62
10	---	---	1.29	1.49	---	1.44	1.29	1.18	1.01
16	---	1.00	1.20	1.41	---	1.40	1.20	1.00	.82
18	---	1.07	1.19	1.42	---	1.44	1.23	1.11	.99
24	---	---	---	1.15	---	1.15	.90	.75	.65
Aver- ages	---	1.04	1.23	1.33	---	1.31	1.09	.96	.82
Depar- tures	---	+.19	+.26	+.15	---	+.07	+.03	+.09	+.10
BLUE HILL, MASS.									
Air mass									
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
Feb. 2	1.07	1.15	---	---	---	---	---	---	---
10	1.04	1.14	1.26	1.42	---	1.42	1.28	1.19	1.04
14	---	---	---	1.26	---	1.26	1.16	1.06	.94
16	---	---	---	---	---	1.41	1.16	1.00	.88
17	---	---	---	---	---	1.35	1.20	1.08	.95
18	1.08	1.20	1.30	1.45	---	1.44	1.29	1.18	1.07
23	.97	1.05	1.17	1.31	---	1.36	1.21	1.04	.90
24	---	---	---	1.36	---	---	1.19	1.05	.93
Aver- ages	1.04	1.14	1.24	1.36	---	1.37	1.21	1.09	.96
Depar- tures	+.13	+.12	+.13	+.06	---	+.07	+.06	+.08	+.06
RATIO BOSTON/BLUE HILL ON COMPARABLE DATES									
---	---	0.89	0.97	0.96	---	1.00	0.94	0.91	0.89
ALBUQUERQUE, N. MEX.									
Air mass									
	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08
Feb. 4	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---
Aver- ages	---	---	---	---	---	---	---	---	---
Depar- tures	---	---	---	---	---	---	---	---	---
NO DATA DURING FEBRUARY 1953									
* Extrapolated									

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of

pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

# SOLAR RADIATION DATA

FEBRUARY 1953

**Table 31a** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

	5	6	7	8	9	10	11	Avg	12	13	14	15	16	17	18	Avg	19	20	21	22	23	24	25	Avg
Date-----	67	72	9	12	92	89	99	63	32	77	109	34	56	53	46	58	44	63	19	58	57	49	54	49
Langleys-----	26	27	28	1	2	3	4	Avg																
Langleys-----	17	46	56	61	64	82	12	48																

**Table 31b** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

	5	6	7	8	9	10	11	Avg	12	13	14	15	16	17	18	Avg	19	20	21	22	23	24	25	Avg
Date-----	208	149	8	9	227	265	123	141	30	57	251	16	239	145	259	143	184	96	21	132	248	237	162	153
Langleys-----	26	27	28	1	2	3	4	Avg																
Langleys-----	16	55	113	211	253	163	18	119																

**Table 31c** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

	5	6	7	8	9	10	11	Avg	12	13	14	15	16	17	18	Avg	19	20	21	22	23	24	25	Avg
Date-----	519	313	12	9	470	563	334	316	25	78	531	9	518	461	549	310	406	269	10	412	559	486	454	371
Langleys-----	26	27	28	1	2	3	4	Avg																
Langleys-----	10	156	223	526	505	204	7	233																

**Table 31d** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

	5	6	7	8	9	10	11	Avg	12	13	14	15	16	17	18	Avg	19	20	21	22	23	24	25	Avg
Date-----	238	104	7	8	214	262	247	154	26	113	265	15	245	245	255	166	188	149	14	234	251	220	247	186
Langleys-----	26	27	28	1	2	3	4	Avg																
Langleys-----	29	183	148	299	207	126	18	144																

**Table 31e** Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

	5	6	7	8	9	10	11	Avg	12	13	14	15	16	17	18	Avg	19	20	21	22	23	24	25	Avg
Date-----	61	83	10	14	80	39	95	55	40	96	50	18	38	41	38	46	64	112	23	79	49	55	51	63
Langleys-----	26	27	28	1	2	3	4	Avg																
Langleys-----	19	73	107	60	88	169	27	78																

Note: Langley is the unit used to denote one gram calorie per square centimeter.



## SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleya.

FEBRUARY 1953

	Akila, Mackenzie	Albuquerque, N.Mex.	Apalachicola, Fla.	Astoria, Ore.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Charleston, S.C.	Cleveland, Ohio	Columbus, Ohio	Davis, Calif.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Fairbanks, Alaska	Ft. Worth, Tex.	Fresno, Calif.	Grand Junction, Colo.	Grand Lake, Colo.	Great Falls, Mont.	Greensboro, N.C.	Griffin, Ga.	Hatteras, N.C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N.Y.	Lake Charles, La.	Las Vegas, Nev.	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WPA5)	Los Angeles, Calif. (WBCO)	Madison, Wis.	
1953																																							
February 5--	31	307	406	98	344	9	123	293	65	246	386	362	---	212	145	77	207	(177)	424	87	397	240	194	157	217	327	302	438	155	331	258	214	332	82	65	348	313	46	
February 6--	23	420	240	176	63	14	138	238	275	207	419	346	---	102	326	68	210	162	410	92	357	210	372	128	139	191	32	211	153	395	67	186	419	230	306	358	348	81	
February 7--	24	379	176	206	11	186	40	(439)	38	263	370	38	---	263	374	31	83	476	31	329	380	190	313	329	180	313	329	380	190	313	329	180	313	329	180	313	329	180	313
February 8--	25	392	493	298	430	21	106	303	315	286	353	297	---	289	364	53	224	124	444	26	479	433	358	209	111	360	57	31	309	380	165	478	194	198	387	460	414	312	
February 9--	26	392	493	298	430	21	106	303	315	286	353	297	---	289	364	53	224	124	444	26	479	433	358	209	111	360	57	31	309	380	165	478	194	198	387	460	414	312	
February 10--	43	139	452	161	376	17	72	362	293	371	338	416	---	212	356	28	260	153	501	42	57	421	413	(397)	308	387	430	180	433	221	139	460	233	89	458	399	52		
February 11--	34	401	284	251	167	(24)	88	288	293	246	179	360	---	27	336	17	202	202	488	42	268	406	404	(412)	96	28	170	111	32	383	155	(176)	412	150	82	434	383	29	
Averages--	32	330	390	193	264	(16)	99	216	254	209	(355)	322	---	204	288	17	192	(145)	431	57	283	346	348	(232)	196	262	257	254	209	378	172	(245)	373	178	207	416	373	102	
Departures--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
February 12--	34	439	231	203	262	22	127	44	364	42	294	244	---	31	372	39	38	157	501	56	522	385	286	(370)	338	163	---	135	25	440	12	506	451	295	388	423	373	140	
February 13--	41	454	494	168	454	15	56	119	284	111	177	452	---	186	366	118	102	142	452	72	515	422	338	(242)	194	330	427	292	292	292	292	292	292	292	292	292	292	292	
February 14--	52	492	197	141	189	18	54	360	201	316	519	294	---	318	262	256	329	158	506	46	196	400	477	327	75	386	154	425	341	45	452	193	122	451	412	154	342		
February 15--	47	462	443	147	285	32	124	18	256	20	554	210	---	132	397	193	26	175	(460)	95	529	426	288	224	136	133	284	342	365	---	38	531	379	272	466	365	351	372	
February 16--	58	500	450	122	428	19	84	380	226	369	488	450	---	77	388	92	317	221	464	57	349	425	436	293	242	371	428	414	53	438	341	261	484	366	310	475	421	327	
February 17--	44	506	194	86	469	22	95	359	144	302	319	418	---	283	380	133	296	(222)	525	62	523	424	435	271	189	405	494	312	404	450	284	310	485	368	448	490	426	349	
February 18--	41	484	539	281	488	42	126	398	232	388	242	493	---	372	416	191	345	151	472	79	102	480	145	237	202	461	515	470	366	380	353	171	264	362	437	486	465	307	
Averages--	45	477	364	164	369	24	95	240	244	221	371	366	---	200	369	146	208	(175)	(483)	67	391	423	344	(281)	197	321	384	342	280	430	220	326	427	316	373	454	410	284	
Departures--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
February 19--	36	276	333	331	218	49	170	337	403	289	428	273	---	170	425	195	284	250	404	---	159	471	215	159	267	369	184	355	125	438	309	75	526	43	68	511	473	105	
February 20--	48	595	263	249	77	57	92	280	438	238	356	211	---	69	374	37	275	---	---	---	(466)	470	420	375	258	198	173	315	147	463	182	79	527	204	154	505	446	63	
February 21--	46	521	141	237	191	53	115	27	411	44	338	272	---	168	417	121	36	---	---	---	63	(524)	475	489	336	324	138	173	315	147	463	182	79	527	204	154	505	446	63
February 22--	62	549	56	301	251	61	79	342	341	320	214	156	420	420	352	292	324	129	518	39	550	443	489	437	199	256	174	137	496	181	363	534	397	491	587	436	266		
February 23--	45	(226)	---	379	305	48	145	404	451	307	142	409	388	408	426	307	355	253	252	82	225	388	474	497	237	465	263	430	403	151	258	64	454	385	327	168	126	391	
February 24--	74	232	---	368	66	60	105	391	415	352	352	93	34	330	295	425	131	176	261	(82)	155	483	158	303	361	60	54	185	215	409	349	81	322	203	145	482	430	200	
February 25--	70	478	390	332	154	---	103	375	389	333	104	54	232	134	439	207	310	216	524	112	353	479	493	447	362	276	139	314	79	469	330	62	532	171	104	487	430	70	
Averages--	54	(391)	236	314	180	55	116	308	413	268	239	200	342	238	415	184	272	205	416	(76)	(347)	459	396	368	303	233	142	283	224	411	274	119	490	262	254	449	397	208	
Departures--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
February 26--	76	544	168	244	451	47	181	22	419	47	144	90	266	342	400	215	54	284	559	77	563	(500)	485	433	158	379	380	67	416	477	127	430	547	363	491	517	470	222	
February 27--	83	531	504	174	---	90	111	170	441	163	449	520	188	430	393	141	190	229	542	168	574	(504)	491	---	480	219	350	531	526	411	487	299	444	555	393	460	511	448	202
February 28--	98	564	300	318	539	---	124	234	295	235	488	494	259	403	324	127	238	(191)	86	48	331	(417)	---	(480)	213	506	534	533	387	471	264	237	449	117	477	263	208	298	
March 1--	128	564	300	318	539	---	124	234	295	235	488	494	259	403	324	127	238	(191)	86	48	331	(417)	---	(480)	213	506	534	533	387	471	264	237	449	117	477	263	208	298	
March 2--	128	564	300	318	539	---	124	234	295	235	488	494	259	403	324	127	238	(191)	86	48	331	(417)	---	(480)	213	506	534	533	387	471	264	237	449	117	477	263	208	298	
March 3--	137	443	395	202	72	215	258	463	210	511	118	188	66	437	166	261	158	348	169	531	512	479	266	428	57	109	103	51	526	122	230	569	185	166	550	495	83		
March 4--	111	586	284	283	393	(107)	271	29	438	51	565	283	61	105	437	166	437	166	437	166	437	166	437	166	437	166	437	166	437	166	437	166	437	166	437	166	437	166	
Averages--	105	400	395	279	302	(77)	179	230	334	208	453	273	190	246	403	156	219	(217)	471	135	(471)	(467)	499	(374)	289	278	308	280	264	504	265	(317)	536	326	327	497	431	241	
Departures--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Accumulated Departures January 1 to March 4, 1953

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

## SOLAR RADIATION DATA

**Table 33—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langley's. —Continued**

FEBRUARY 1953

		Medford, Ore.	Miami, Fla.	Nashville, Tenn.	New York, N.Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Put-in-Bay, Ohio	Rapid City, S.Dak.	Riverside, Calif.	Salt Lake City, Utah	San Antonio, Tex.	Santa Maria, Calif.	Sault Ste. Marie, Mich.	Saville, N.Y.	Schenectady, N.Y.	Seabrook, N.J.	Seattle, Wash. (U. of W.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Is., B.W.I.	Tampa, Fla.	Upton, N.Y.	Washington, D.C. (Amer. U.)	Minneapolis, Minn.	JANUARY	Barrow, Alaska	Put-in-Bay, Ohio	Salt Lake City, Utah	Saville, N.Y.	State College, Pa.	Swan Is., B.W.I.						
1953	February 5--	52	365	270	300	273	295	134	345	152	299	265	78	464	373	88	345	186	321	114	97	299	284	480	476	327	319	136	1	166	18	---	285	61	470						
	February 6--	203	403	113	221	304	390	260	352	373	51	221	155	294	59	74	47	357	355	215	335	135	135	140	527	355	---	215	135	2	140	29	71	117	109	332					
	February 7--	33	357	336	29	154	401	137	304	390	304	390	260	500	412	154	31	527	355	46	123	272	362	460	448	42	---	46	123	272	3	67	47	207	62	55	367				
	February 8--	311	486	367	18	332	352	149	432	151	401	202	500	412	154	31	527	355	46	123	272	362	460	448	42	---	46	123	272	4	148	221	207	244	109	445					
	February 9--	327	472	364	295	338	72	263	434	335	96	425	141	216	453	223	349	191	327	163	235	302	26	462	462	46	---	46	123	272	5	148	221	207	244	109	445				
	February 10--	327	472	364	295	338	72	263	434	335	96	425	141	216	453	223	349	191	327	163	235	302	26	462	462	46	---	46	123	272	6	148	221	207	244	109	445				
	February 11--	321	336	43	351	337	397	201	367	337	397	201	367	337	397	201	367	337	397	201	367	337	397	201	367	337	397	201	367	337	397	201	367	337	397	201	367	337			
	Averages----	231	402	242	226	200	285	206	(413)	147	238	387	190	359	418	133	230	165	220	117	131	214	246	479	422	228	228	233	(205)	143	91	116	178	121	394	---					
	Departures----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	February 12--	316	408	71	48	18	47	465	114	467	46	356	441	295	536	444	186	37	34	121	81	109	27	417	557	539	31	115	283	8	237	6	138	43	37	469	---				
	February 13--	291	226	208	195	169	201	386	261	441	232	163	448	125	253	455	185	226	185	198	93	68	197	429	505	519	247	212	145	9	237	15	115	27	37	469	---				
	February 14--	169	418	210	362	290	252	375	189	470	348	305	442	247	398	444	156	360	258	360	64	92	83	411	441	426	17	50	307	10	230	36	128	50	38	416	---				
	February 15--	138	341	403	13	15	232	454	86	455	281	168	386	413	549	472	248	18	36	38	76	92	83	411	441	426	17	50	307	11	230	36	128	50	38	416	---				
	February 16--	106	568	257	350	311	267	478	364	487	76	333	459	334	274	462	247	346	285	261	152	151	272	445	520	572	314	274	312	12	283	144	108	127	171	454	---				
	February 17--	144	371	380	355	379	283	478	356	490	279	365	464	364	232	457	330	396	303	358	146	144	310	425	437	501	326	316	264	13	190	199	108	177	177	463	---				
	February 18--	---	401	436	407	381	413	441	387	476	282	201	424	154	167	481	162	424	309	361	181	172	348	426	283	569	393	406	289	14	97	178	100	214	203	284	---				
	Averages----	194	405	281	247	223	247	440	251	469	220	270	438	276	344	459	216	258	201	242	113	118	225	419	472	518	238	250	(266)	220	84	120	96	108	378	---					
	Departures----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	February 19--	370	455	161	---	272	173	86	(275)	521	187	210	491	174	399	495	176	333	255	315	160	218	229	46	543	479	315	300	295	15	259	68	319	189	205	468	---				
	February 20--	276	---	108	---	190	6	388	(243)	505	80	362	447	334	485	452	60	304	198	190	158	172	73	410	548	510	329	346	300	16	305	121	226	157	52	467	---				
	February 21--	366	---	412	---	71	343	513	(280)	529	149	396	467	(382)	617	485	232	38	91	123	115	144	302	446	552	460	32	218	197	18	70	148	269	133	475	---					
	February 22--	251	461	412	---	357	284	500	294	529	416	402	380	462	480	362	480	362	328	281	243	283	365	452	565	405	---	401	(273)	19	108	80	63	34	61	353	---				
	February 23--	423	479	391	---	381	371	440	330	493	506	350	527	113	281	485	231	362	256	244	298	334	344	171	582	452	353	202	382	20	123	46	125	165	102	424	---				
	February 24--	430	573	75	---	330	68	337	374	292	292	479	384	210	489	488	201	362	256	244	298	334	344	171	582	452	353	202	382	20	123	46	125	165	102	424	---				
	February 25--	409	576	75	---	281	68	246	(396)	514	257	392	479	384	210	489	488	201	362	256	244	298	334	344	171	582	452	353	202	382	20	123	46	125	165	102	424	---			
	Averages----	362	503	233	---	269	184	333	(280)	481	254	351	417	(330)	351	469	253	306	237	262	215	239	273	312	558	463	271	276	(292)	163	100	148	136	98	451	---					
	Departures----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	February 26--	435	384	408	---	239	312	521	100	546	303	361	510	394	636	505	212	269	106	265	74	76	212	480	448	474	238	313	233	22	158	54	252	282	119	446	---				
	February 27--	407	545	468	---	292	416	527	243	471	199	337	511	402	513	503	340	316	215	336	31	53	219	469	600	560	---	---	---	---	---	---	---	---	---	---					
	February 28--	197	466	504	---	370	448	417	439	82	241	186	389	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	March 1--	231	496	54	---	283	136	502	444	217	344	245	295	141	435	510	354	446	367	416	362	348	387	380	605	576	378	426	389	24	337	27	209	23	108	291	---				
	March 2--	319	554	---	---	283	136	502	444	217	344	245	295	141	435	510	354	446	367	416	362	348	387	380	605	576	378	426	389	24	337	27	209	23	108	291	---				
	March 3--	426	506	82	---	105	79	156	195	543	110	404	543	482	393	544	149	195	105	69	59	64	48	110	593	593	433	98	193	26	258	106	141	190	144	295	---				
	March 4--	464	546	74	---	37	181	560	124	589	129	395	541	210	489	488	201	362	256	244	298	334	344	171	582	452	353	202	382	20	237	210	257	20	258	106	141	190	144	295	---
	Averages----	354	499	265	---	248	242	433	282	(376)	203	331	475	301	487	431	297	299	228	221	147	140	218	384	578	552	284	259	(283)	(2)	219	120	200	156	131	415	---				
	Departures----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	February 29--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	March 1--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	March 2--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	March 3--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	March 4--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	Averages----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	Departures----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	February 29--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	March 1--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
	March 2--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---														

Note.--Langley is the unit used to denote one gram calorie per square centimeter.  
Values in parentheses are interpolated.



## ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

FEBRUARY 1953

Station	Day of month																															Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Baltimore, Md.-----	236	259	109	260	255	224	105	207	305	294	73	113	129	339	49	230	317	339	287	155	219	316	382	204	285	---	(29)	1	363				227
Philadelphia, Pa.-----	220	159	89	265	224	237	65	102	297	305	64	104	152	305	---	272	356	318	251	196	---	292	364	288	251	231	266	316					230

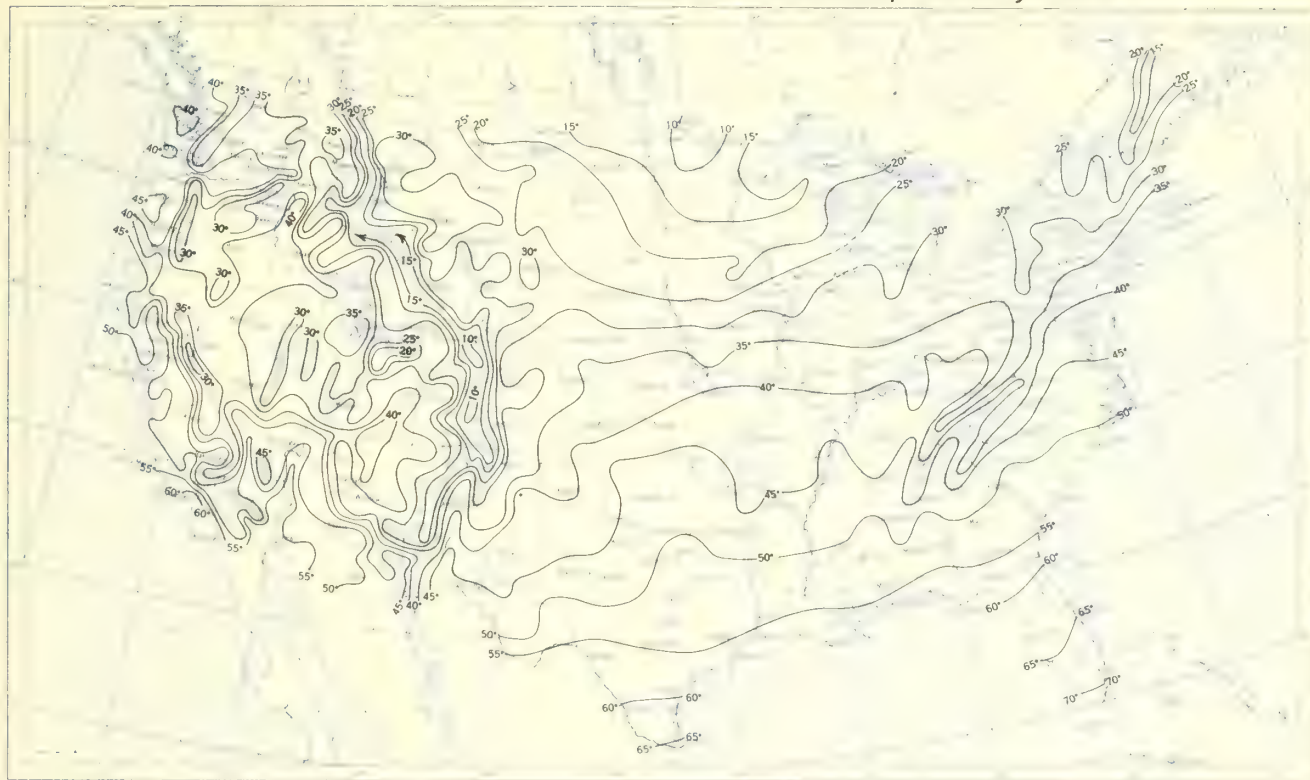
The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continuous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in Illuminating Engineering, Vol. XLVI, No. 2, pages 59 to 62.

The illuminometer at Philadelphia is mounted on the roof of the Custom House (City Office), South Second and Chestnut Streets. Station coordinates are latitude  $39^{\circ} 57' N$ , and longitude  $75^{\circ} 9' W$ . Elevation of the instrument is 177 feet above the ground and 203 feet above sea level.

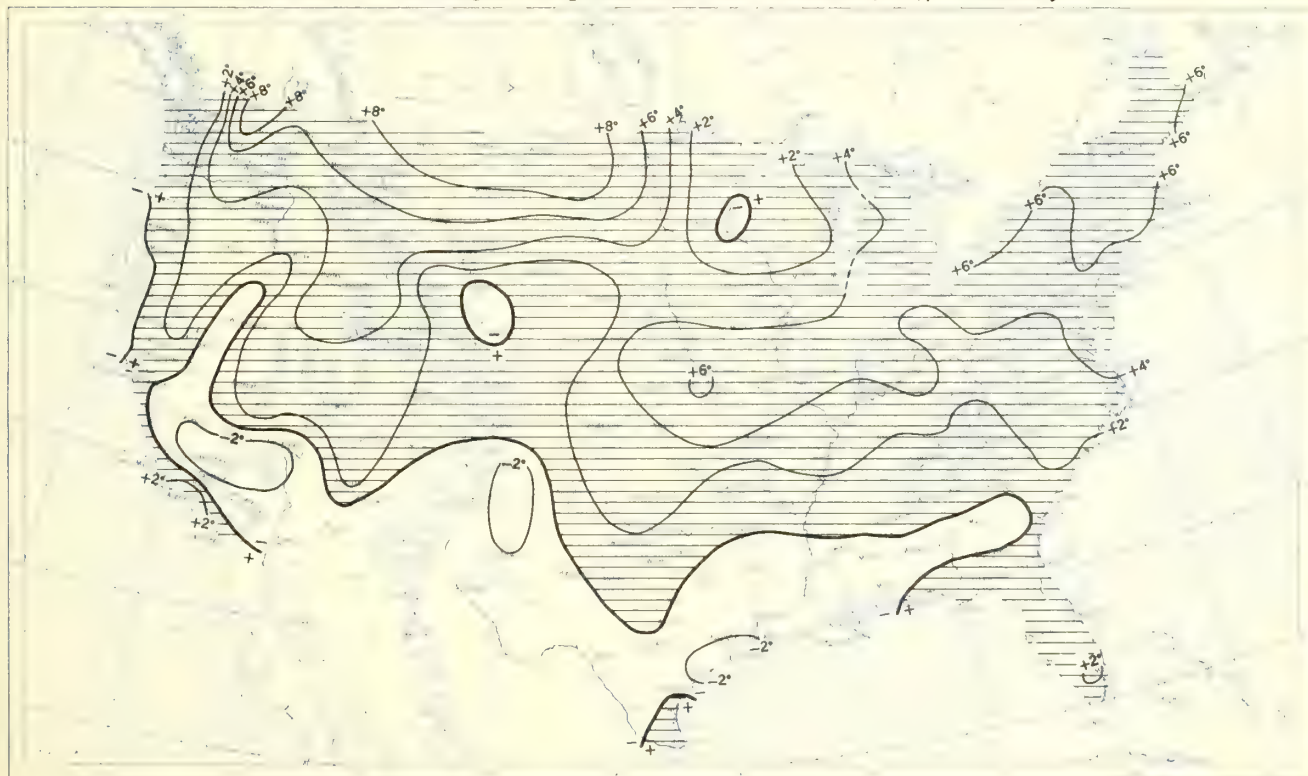
Several chemical plants along the rivers in S. Philadelphia are sources of air pollution, usually during periods of stagnant air.

NWRC, Asheville, N.C. --- 5/20/53 --- 2200

Chart I. A. Average Temperature ( $^{\circ}\text{F.}$ ) at Surface, February 1953.



B. Departure of Average Temperature from Normal ( $^{\circ}\text{F.}$ ), February 1953.

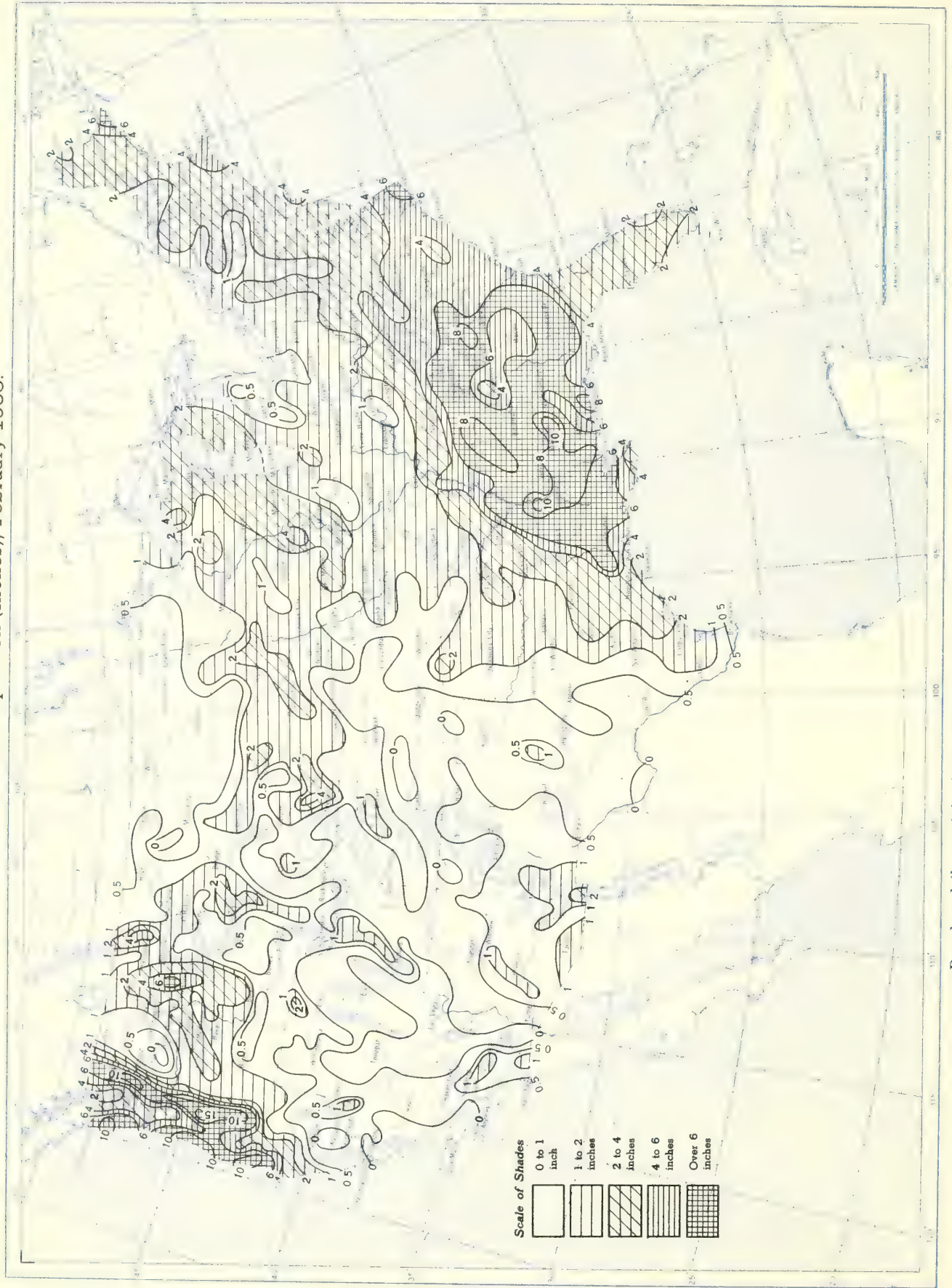


A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.



Chart II. Total Precipitation (Inches), February 1953.

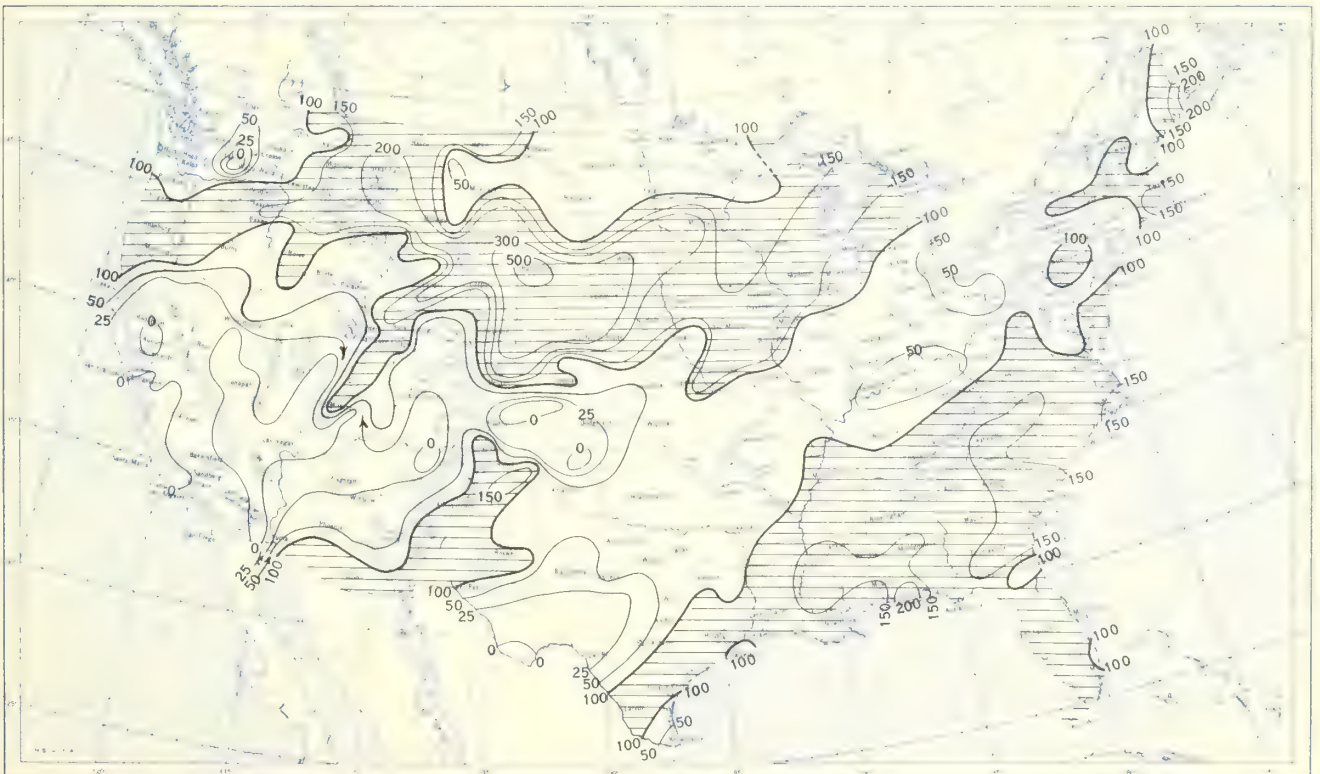


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), February 1953.



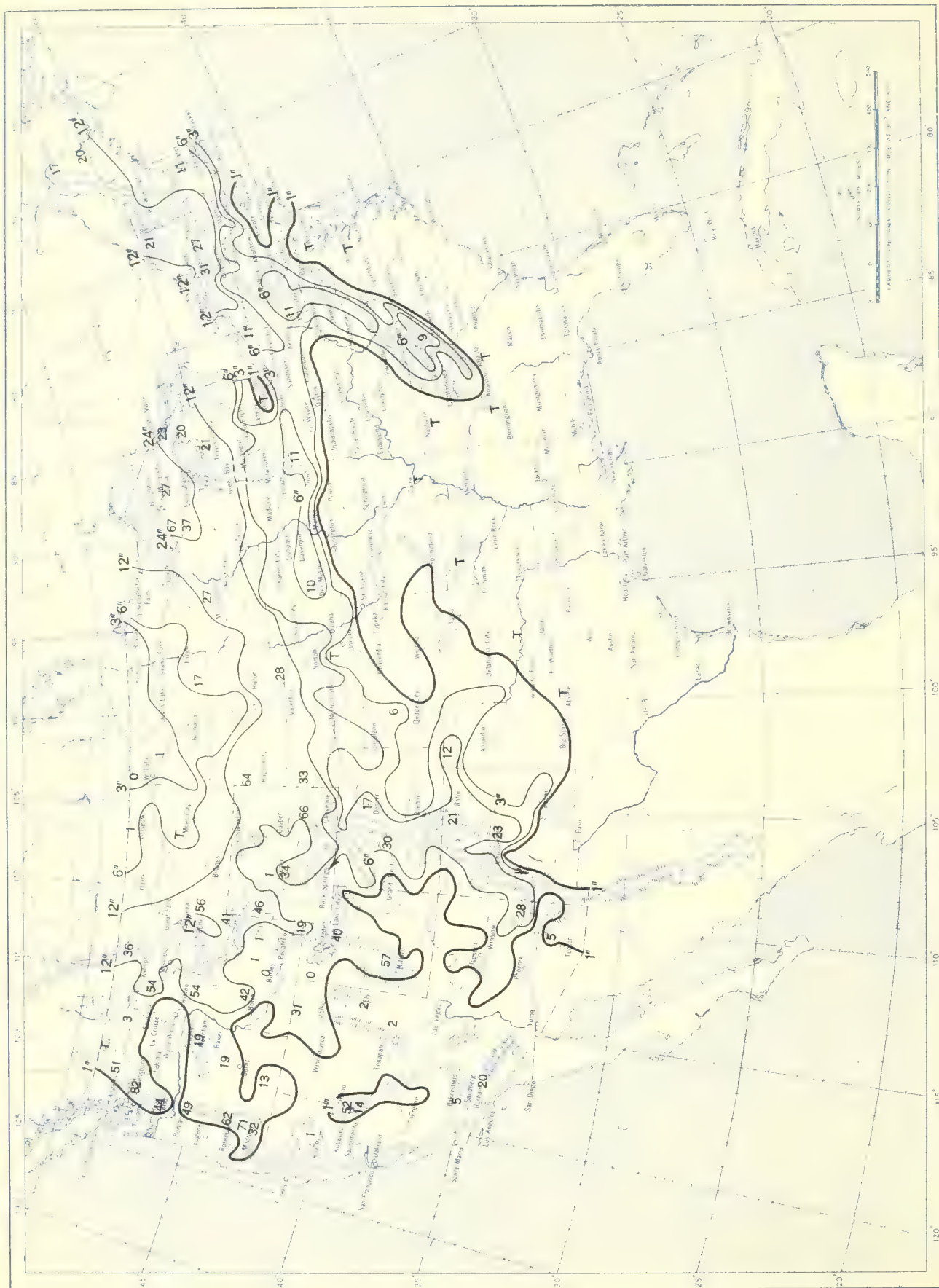
B. Percentage of Normal Precipitation, February 1953.



Normal monthly precipitation amounts are computed for stations having at least 10 years of record.



Chart IV. Total Snowfall (Inches), February 1953

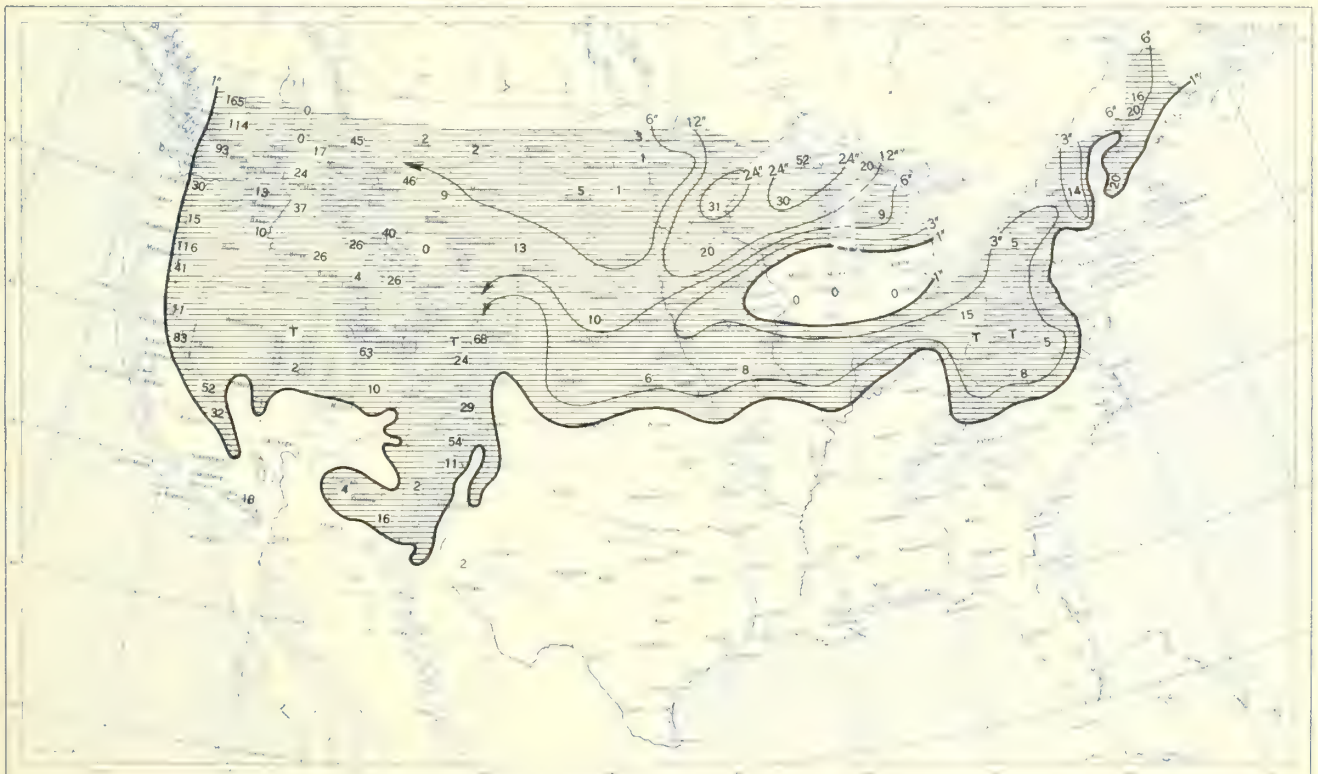


This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, February 1953.



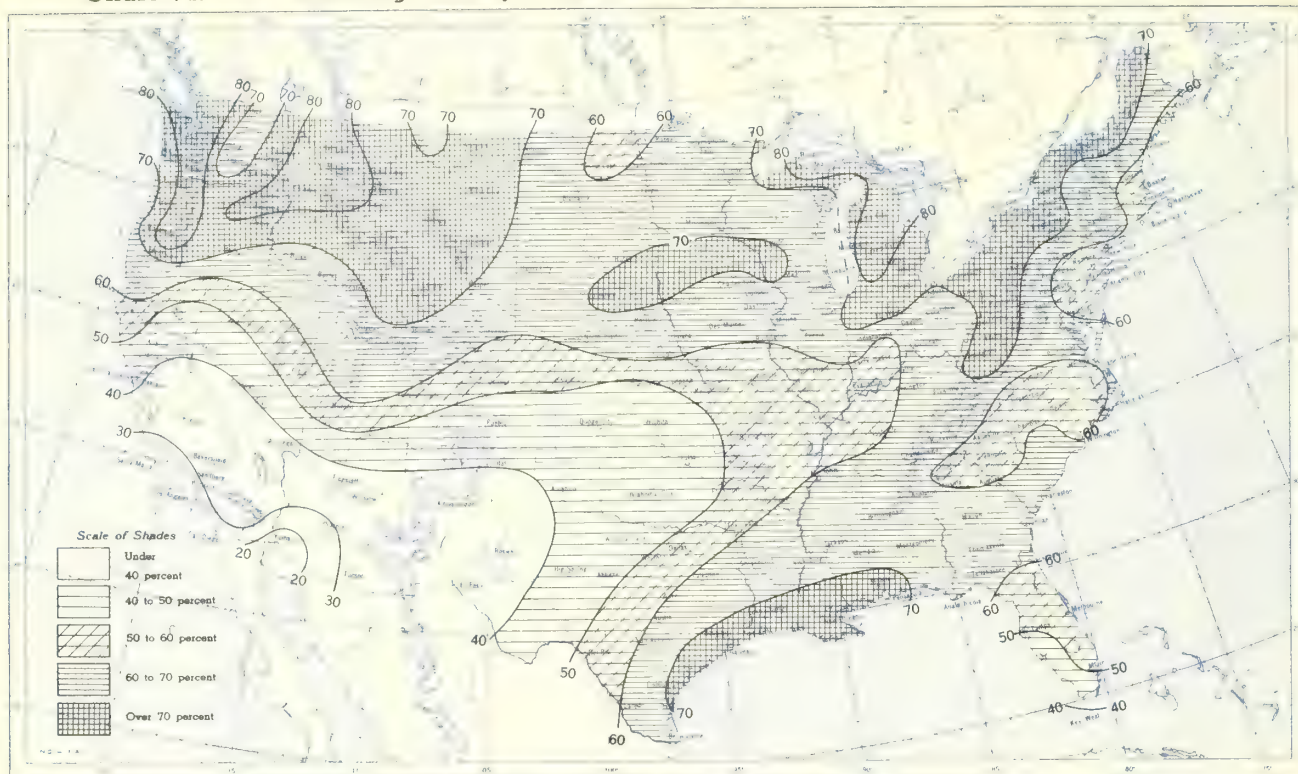
B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T., February 24, 1953.



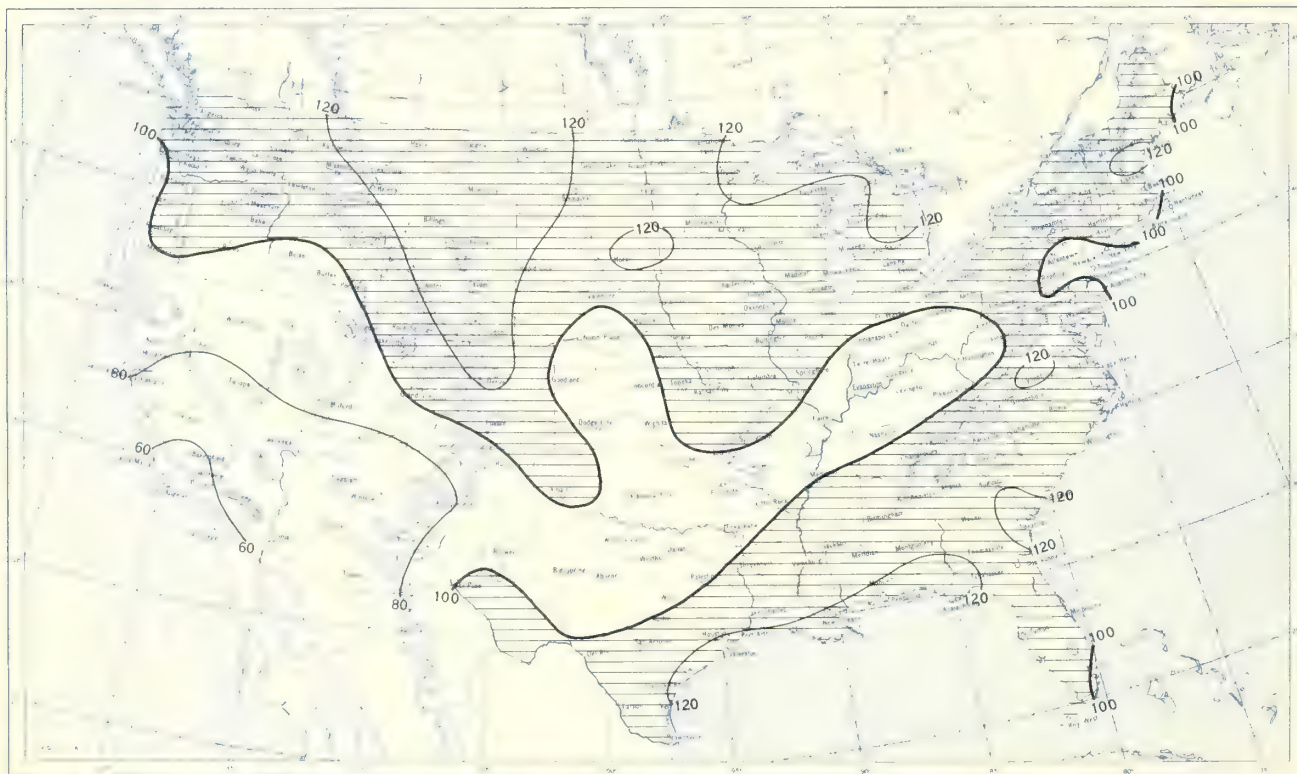
A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.  
 B. Shows depth currently on ground at 7:30 a. m. E. S. T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.



Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, February 1953.

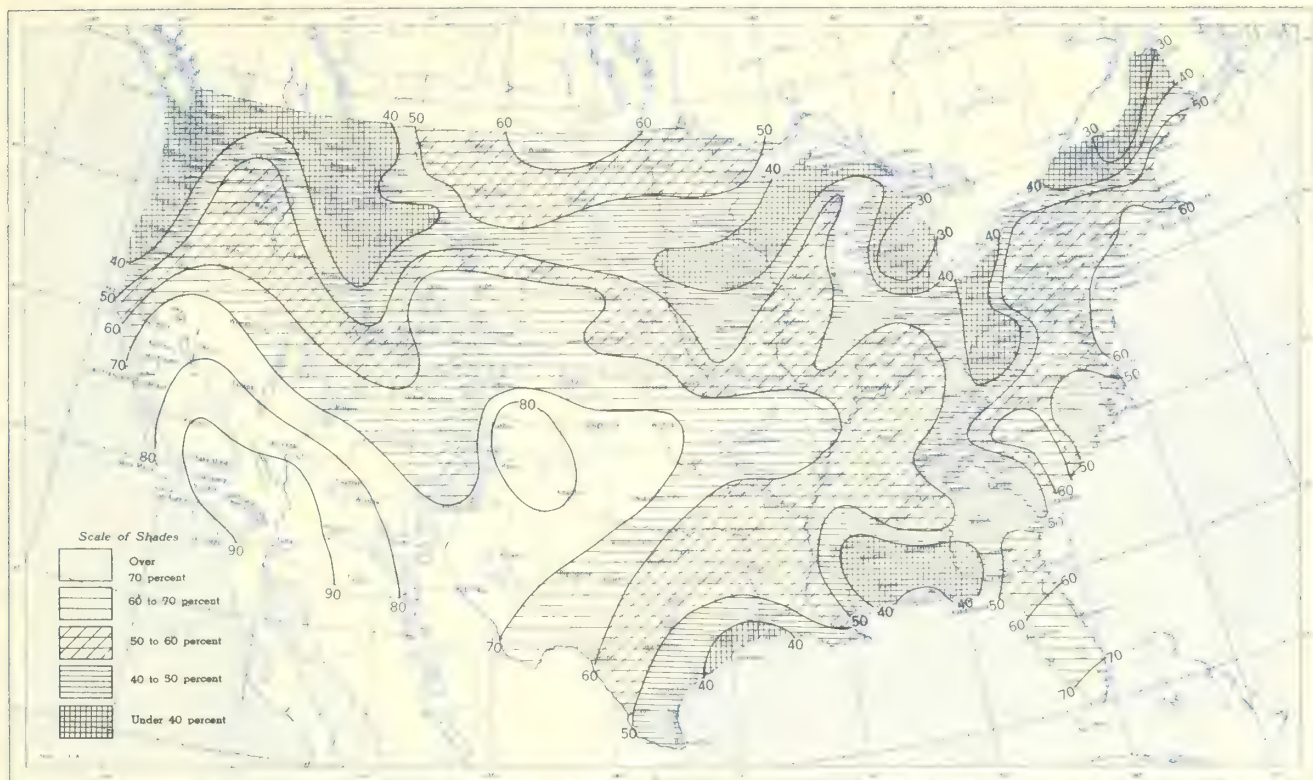


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, February 1953.

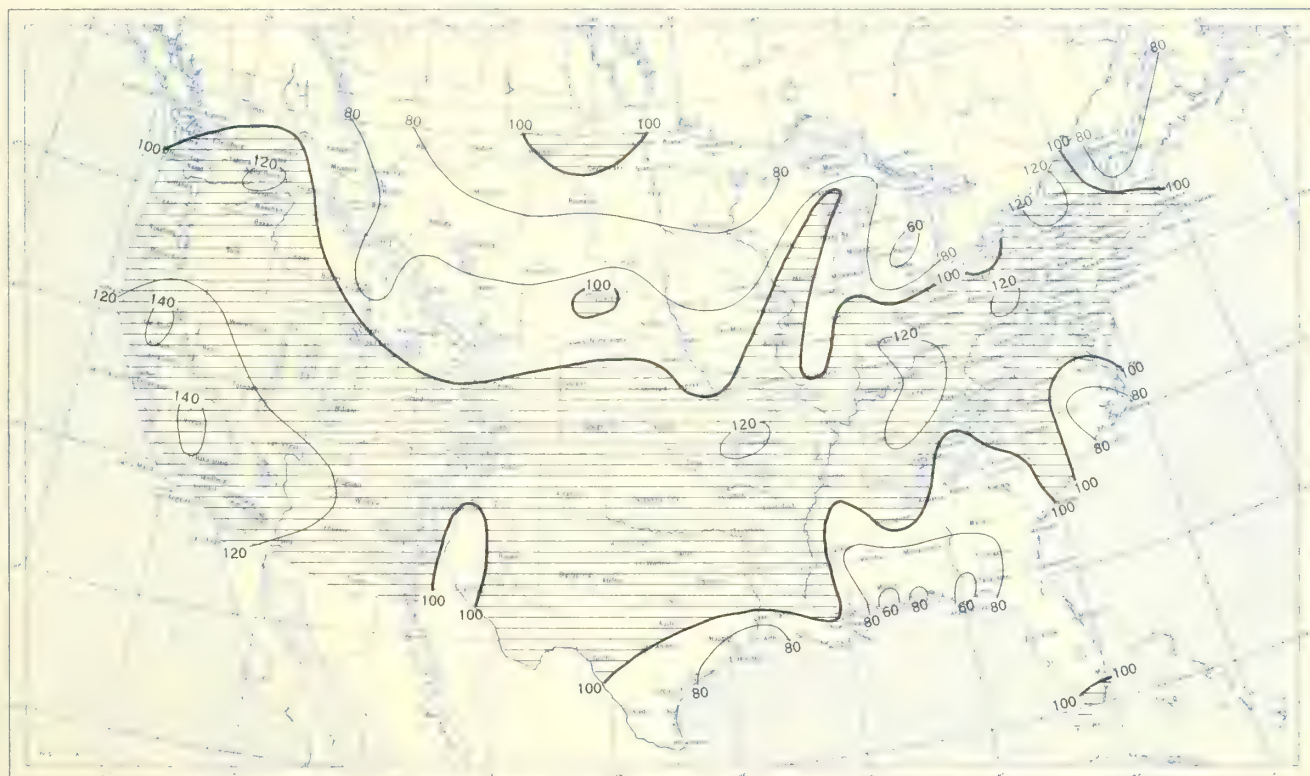


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, February 1953.



B. Percentage of Normal Sunshine, February 1953.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.



Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, February 1953. Inset: Percentage of Normal Average Daily Solar Radiation, February 1953.

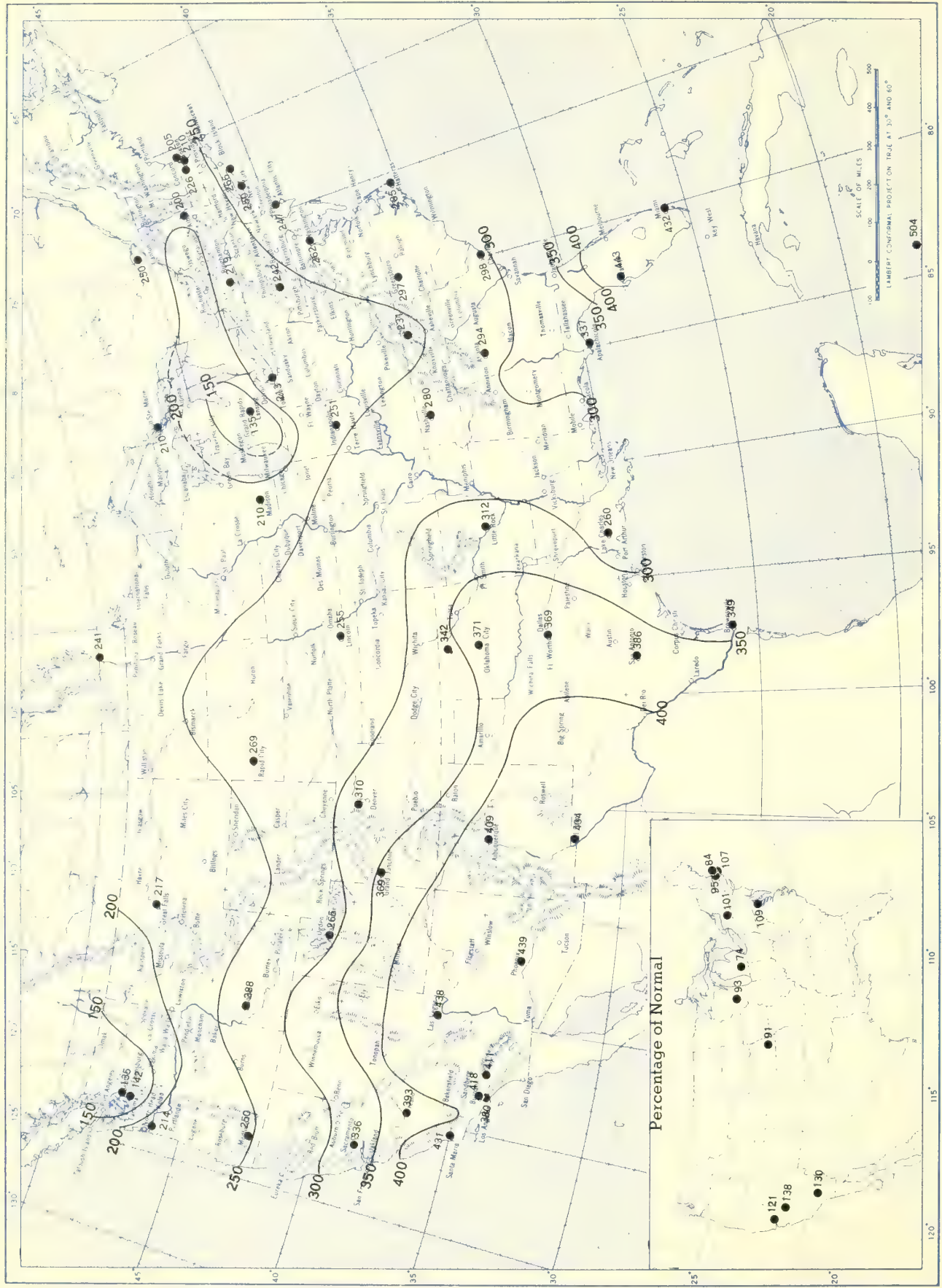
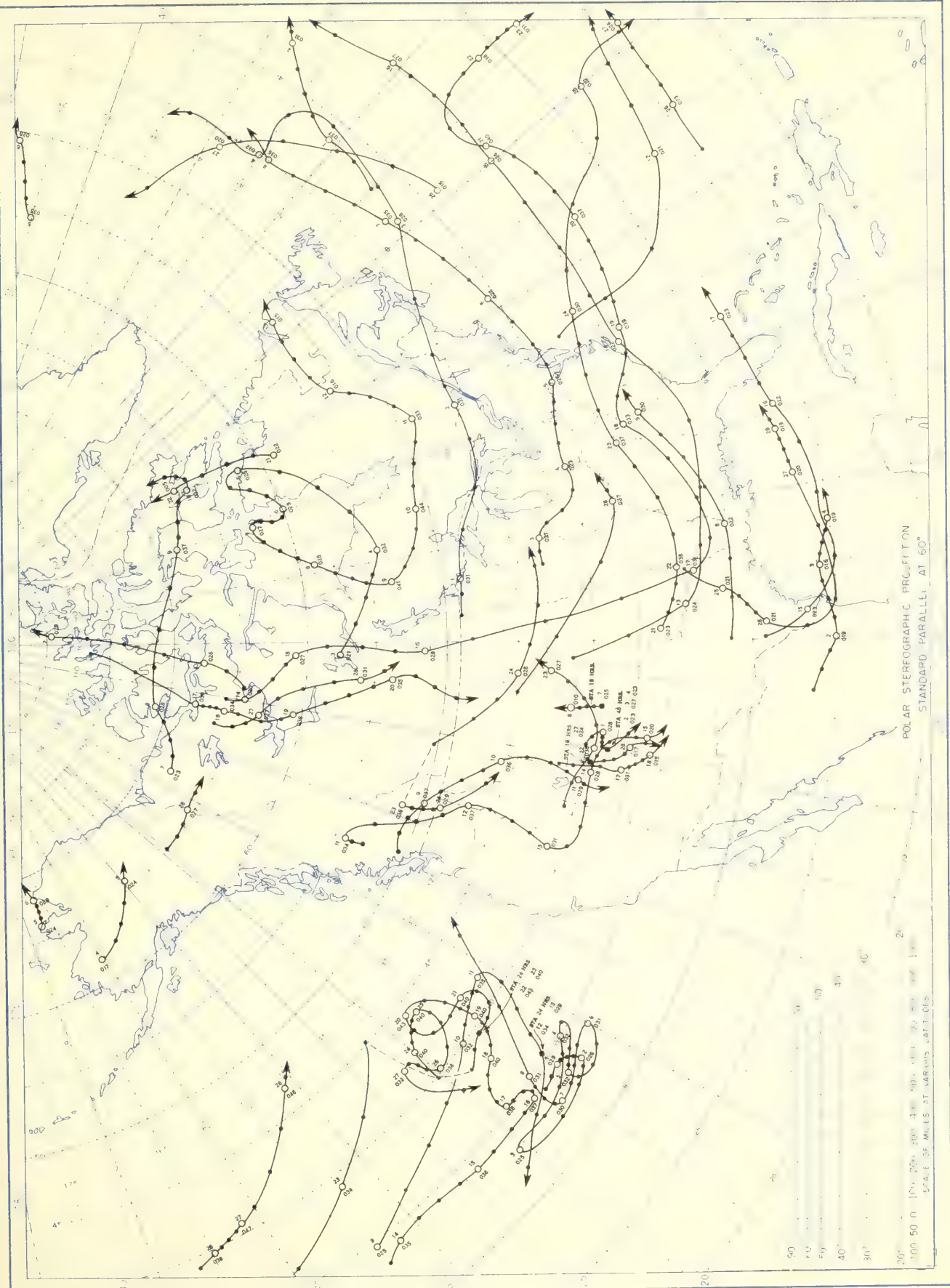


Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langley (1 langley = 1 gm. cal. cm. <sup>-2</sup>). Basic data for isotherms are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals

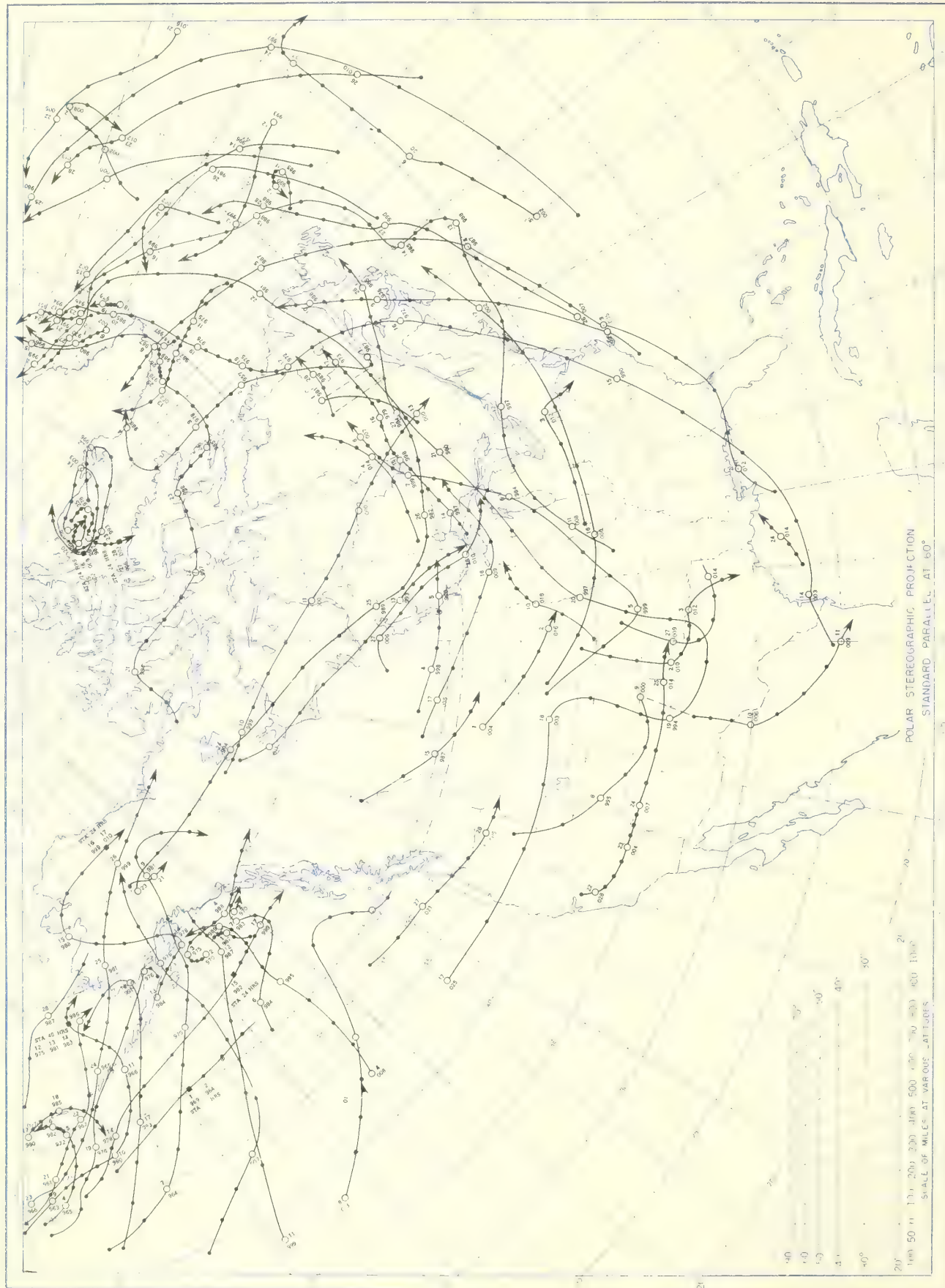
Chart IX. Tracks of Centers of Anticyclones at Sea Level, February 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Squares indicate position of stationary center for period shown. Dots indicate intervening 6-hourly positions. Only those centers which could be identified for 24 hours or more are included. Dashed line in track indicates reformation at new position.



Chart X. Tracks of Centers of Cyclones at Sea Level, February 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

1024 POLAR STEREOGRAPHIC PROJECTION  
STANDARD PARALLEL AT 60°

SCALE: 1" = 500 MILES AT 60° LATITUDE

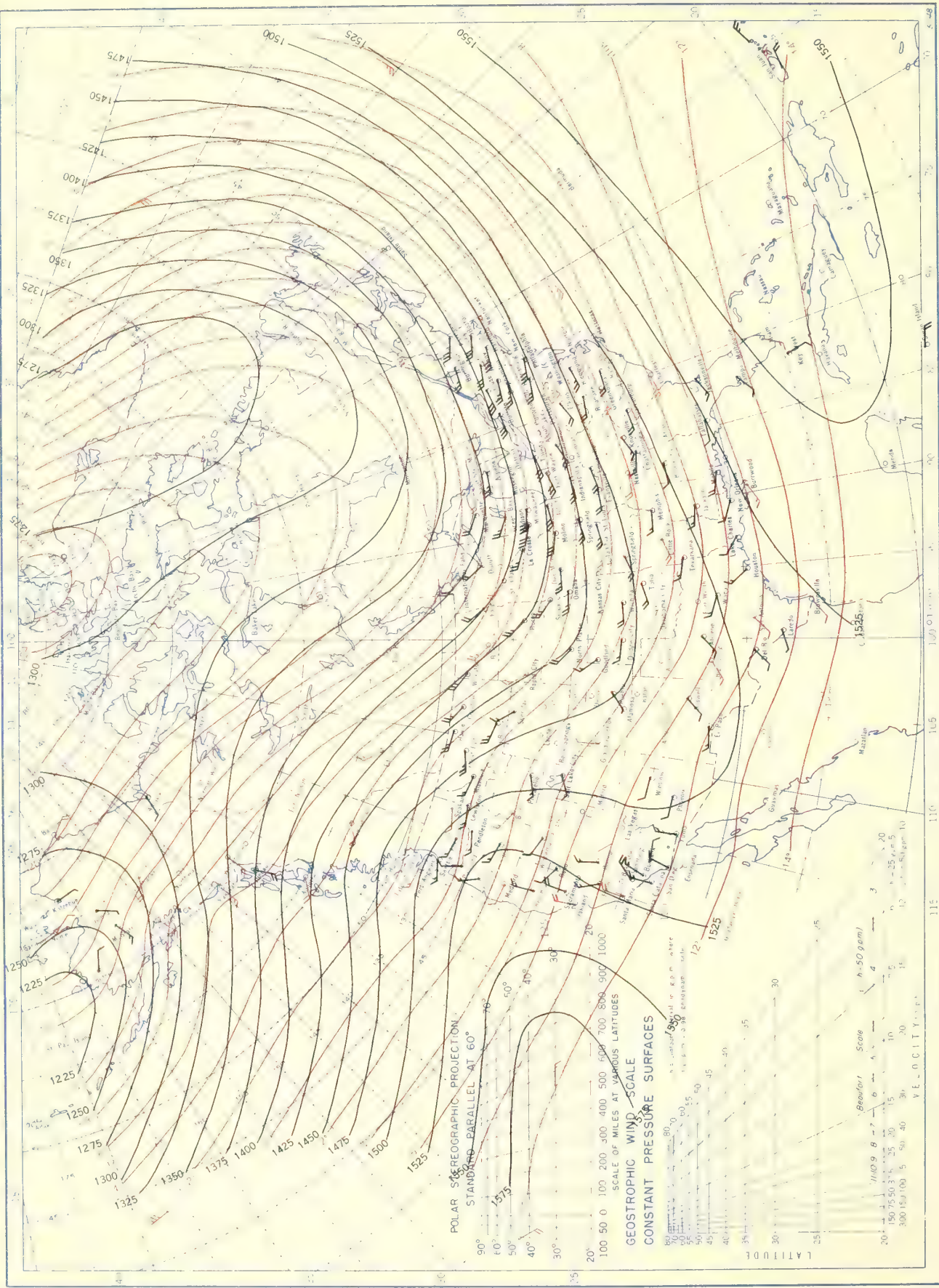
Departure From Normal

25 HOURLY PERCENTAGES 25  
GALMS

Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° inter-sections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.



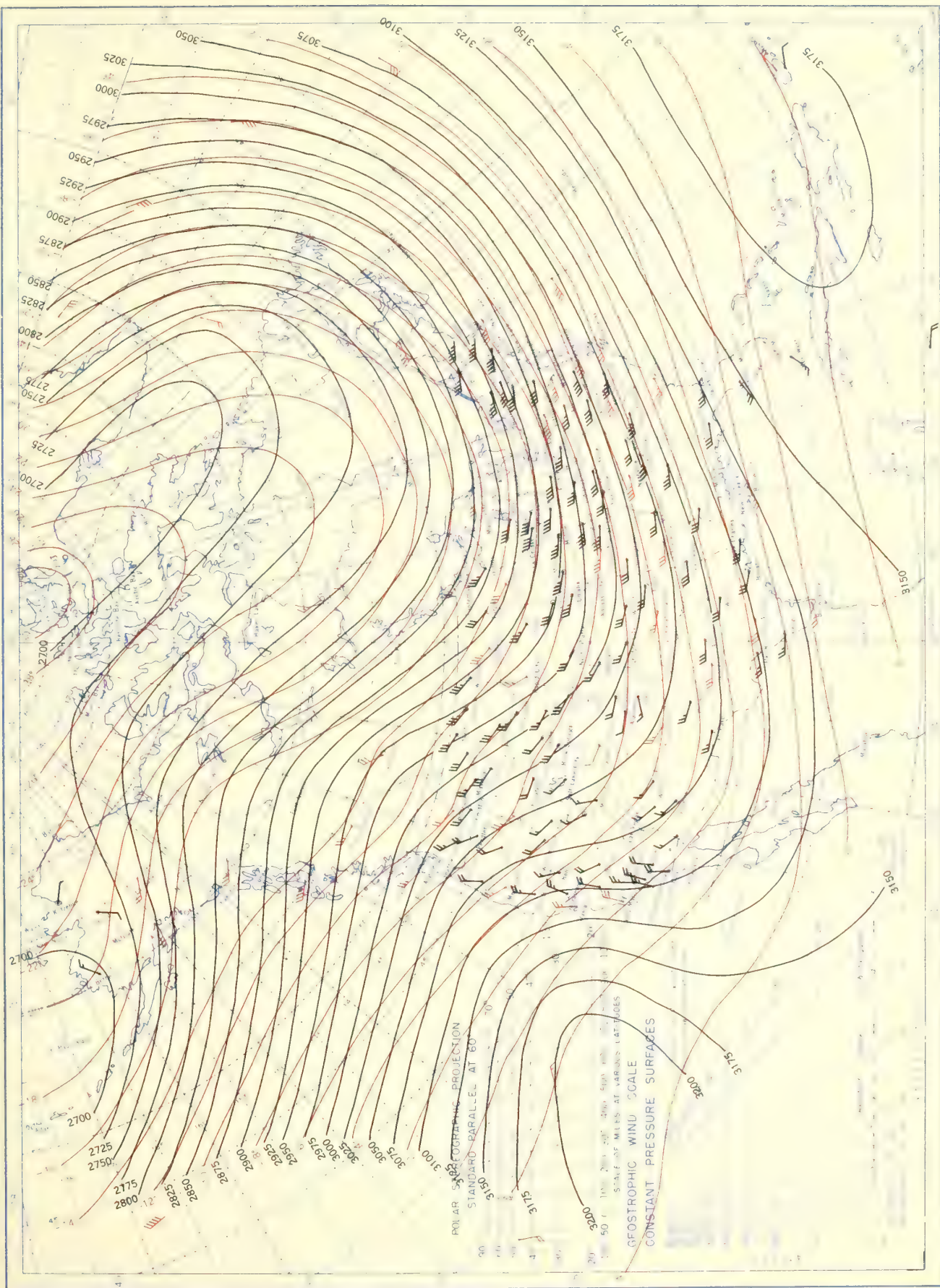
Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), February 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.



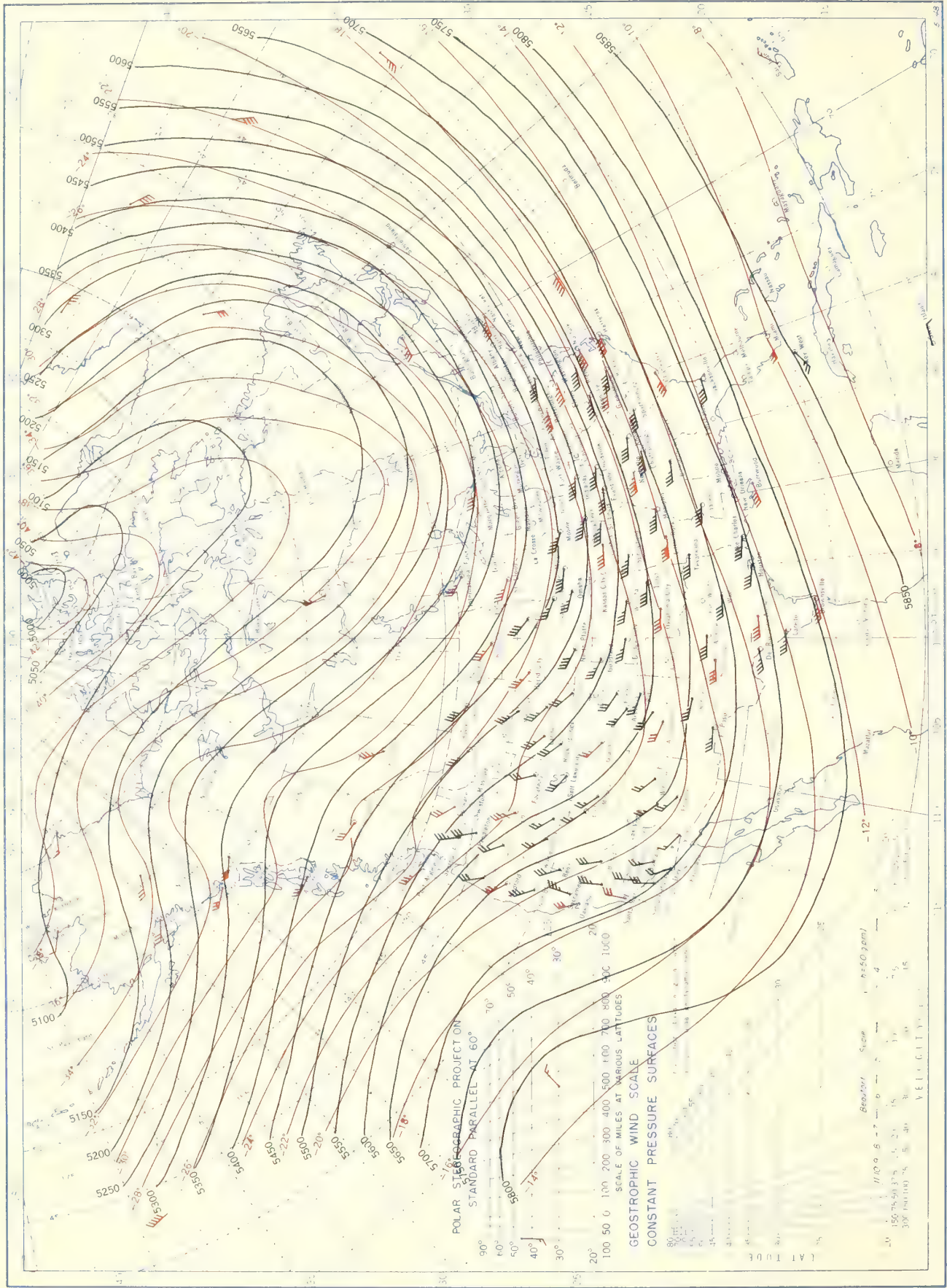
Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m. s. l.), February 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.



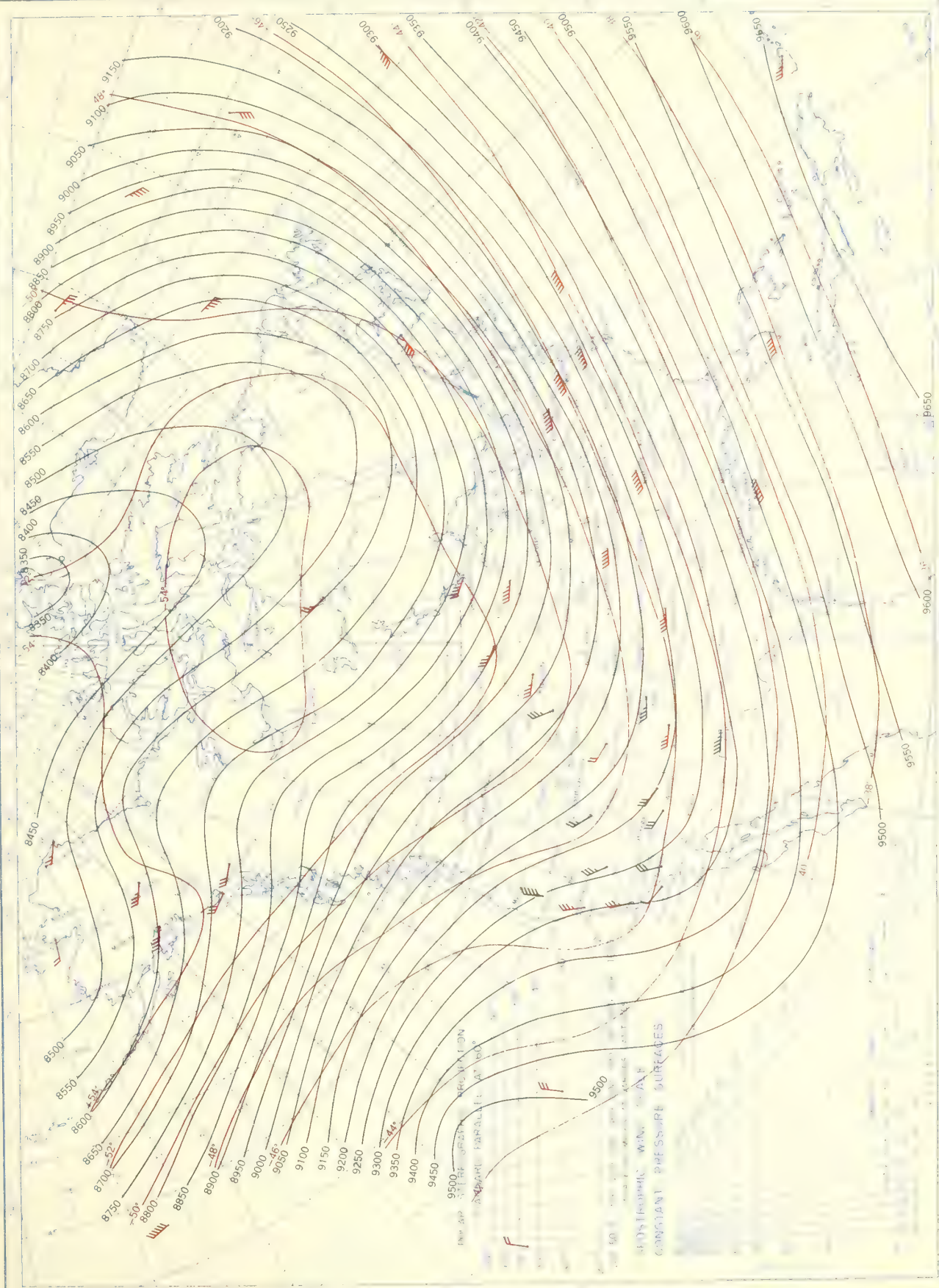
Chart XIV. Average Dynamic Height in Geopotential Meters (1 g. p. m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m. s. l.), February 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.



Surface. Average Temperature in C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), February 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T. those shown in red are based on rawins at 0300 G. M. T.



U. S. Department of Commerce  
WEATHER BUREAU  
Official Business  
Permit No. 1024

Penalty for private use to avoid  
payment of postage, \$300

Clemson College Library  
Clemson  
South Carolina

CD

AGRICULTURAL REFERENCE DEPARTMENT  
CLEMSON COLLEGE LIBRARY  
U. S. DEPARTMENT OF COMMERCE  
SINCLAIR WEEKS, Secretary  
WEATHER BUREAU  
F. W. REICHELDERFER, Chief

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

MARCH 1953  
Volume 4 No. 3





## C O N T E N T S

SURFACE DATA	Page
General Summary of Weather Conditions-----	55
Condensed Climatological Data - States-----	57
Climatological Data - Stations-----	58
Heating Degree Days-----	63
Severe Storms-----	64
General Summary of River and Flood Conditions-----	72
Flood Stage Data-----	75
UPPER AIR DATA	
Radiosonde Data-----	77
Pilot Balloon Data-----	80
Rawin Data-----	81
SOLAR RADIATION DATA	
Solar Radiation Intensities-----	82
Blue Hill Data-----	83
Daily Totals and Average Daily Totals by Weeks-----	84
Daily Illumination on a Horizontal Surface-----	86
CHARTS I-XV	

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

SUBSCRIPTION PRICE: Monthly and annual, 15 cents per copy; yearly subscription, including monthly and annual issues, \$1.50. Checks and money orders should be made payable to the "Treasurer of the United States." Remittance and correspondence regarding subscriptions should be sent to "Superintendent of Documents, Government Printing Office, Washington 25, D. C."

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

Volume 4 No. 3

MARCH 1953

### GENERAL SUMMARY OF WEATHER CONDITIONS

March was the fourth consecutive month featured by unseasonably mild temperatures east of the Continental Divide. As a result many northern lakes and rivers became navigable unusually early. Lake Ontario was virtually free of ice all winter at Buffalo, N. Y., where the beginning of navigation on March 2 was the earliest during the past 100 years. In the Mississippi River navigation was resumed at La Crosse, Wis., on the 17th and at St. Paul, Minn., on the 28th. Ice broke up in the Missouri River at Sioux City, Iowa, on the 11th, but was still holding at Williston, N. Dak., on the 31st. In much of the Country the growth of vegetation, favored by warm weather, had advanced from one to three weeks beyond normal by the end of the month. On a Nation-wide basis precipitation averaged slightly above normal, with greatest excesses in the Mississippi Valley and Northeast where frequent moderate to heavy rains delayed early spring field activities and resulted in destructive floods in New England. In the remainder of the country precipitation departures from normal varied greatly in short distances. In western portions of the lower Great Plains small grains and pastures, already in poor condition as a result of deficient moisture since last summer, continued to deteriorate. Owing to mild temperatures during periods of heaviest precipitation, snowfall generally was well below average, and after the first decade the snowcover (which was limited both in depth and extent) melted rapidly and almost completely disappeared outside of mountainous areas during the fourth week. In the extreme upper portions of the Great Plains and Mississippi Valley much of the snowmelt was absorbed by relatively dry, frost-free soil; consequently, runoff was reduced and little flooding occurred. For the second time in 11 years the Red River of the North did not overflow. Thunderstorm frequency was above normal in south-central areas but about normal elsewhere. Sunshine was much below normal in the northeastern quarter (Detroit, Mich., recorded only 45 percent of normal and Grand Rapids 49), but was normal or above in most other sections of the Country.

**TEMPERATURES.**—March temperatures averaged slightly below normal in the Pacific States and well above in the remainder of the Country. Most sections experienced their coldest weather during the first 11 days. This period was particularly cold in the northern Great Plains and upper Mississippi Valley where averages ranged from 3° to 6° below normal and the month's lowest temperature, -35°, was recorded at Big Falls, Minn., on the 7th.

Subnormal temperatures generally prevailed in the Pacific States during most of the month. Frost slightly damaged some fruit on the central coast and in the Central Valley of California during the first three days, and some advanced fruit in Washington later in the month.

After the first 11 days unusually warm weather prevailed east of the Pacific States, except for a brief period of below-normal temperatures in

the eastern half of the Country during the last week when most stations in the extreme Southeast recorded their lowest temperatures of the month. In much of the South, however, no freezing occurred, as may be noted from the following monthly minima: Little Rock, Ark., and Memphis, Tenn., 34°; Montgomery, Ala., 38°; Macon, Ga., 36°; and Charleston, S. C., 35°.

Highest temperatures in the Pacific States generally occurred on the 7th, 8th, or 9th, in the Rocky Mountain States on the 27th or 28th, in the Great Plains and Northeast from the 20th to 23d, and in the Southeast and South about the middle or at the end of the month. The hottest weather occurred in Texas where the month's highest temperature, 101°, was recorded at Rio Grande City on the 21st.

**PRECIPITATION.**—Heavy rains in the Northeast produced near-record March totals at many stations. Totals for a few principal cities are as follows: Philadelphia, Pa., 6.83 inches (third greatest on record); Albany, N. Y., 5.74 (third greatest since 1826); New York City, 7.91 (greatest in 83 years of record); Trenton, N. J., 7.53 (greatest since 1912); and New Haven, Conn., 10.78 inches (greatest in 81 years of record). Even greater monthly totals occurred at many other stations, including 15.86 inches at Walcott Reservoir, Conn., which was the greatest amount reported east of the Rocky Mountains. In New England during the last 8 days of the month nearly continuous moderate to heavy rains totaling up to 9 inches caused widespread light to severe flooding. Some streams in Maine rose to record stages. Preliminary estimates of flood losses were placed at \$10,000,000 in Maine, \$1,500,000 in New Hampshire, and \$500,000 in the remainder of New England.

Frequent moderate to heavy rains in the lower Mississippi Watershed totaled 11.08 inches at Newburn, Tenn., 11.08 at Fanshawe, Okla., and 11.12 at Center, Tex., but no serious flooding was reported.

In the lower Great Plains heavy rains in eastern sections generally furnished adequate moisture for small grains and other crops; however, in western portions precipitation, while locally above normal, was too light to bring lasting benefits. In Texas moisture was ample east of a line from Abilene to Wichita Falls to carry wheat and oats well along to maturity, but west of that line more rains were needed. In Oklahoma moisture conditions were favorable east of a line from Jackson County in the southwest to Alfalfa County in the northern part of the State; but west of this line precipitation was light and scattered, wheat was in poor condition, surface soil and subsoil were extremely dry, and water had to be hauled for livestock in many localities. In the eastern third of Kansas crops were considerably improved by favorable moisture conditions but in the remainder of the State the effects of the prolonged drought were still of serious concern, even though precipitation received



## GENERAL SUMMARY OF WEATHER CONDITIONS—Continued

MARCH 1953

at the beginning of the month somewhat lessened the extreme need for moisture.

**SNOWFALL.**—East of the Rocky Mountains nearly all the month's snowfall occurred during the first 10 days. At the end of February the ground was bare, except around the Great Lakes, in the Black Hills, and in the northern Appalachian Mountains; but moderate to heavy snowfall on the first extended the snowcover southward over northern portions of Kansas and Missouri, the Ohio Valley, and thence eastward over the Virginias and Maryland. This was the heaviest snowfall of the season in eastern Virginia, where Richmond measured 4 inches and Norfolk 1.2 inches, the latter city's only measurable snowfall during the season. In the Midwest the ground was again bare on the 3d, and in Maryland and the Virginias on the 5th, but intermittent snowfall continued through the 3d in the central Great Plains, with the greatest amounts falling in south-central Iowa, northwestern Kansas, and northwestern Missouri where depths ranged up to 13 inches at St. Joseph. Drifting in Nebraska and South Dakota on the 1st blocked some roads.

Another snowstorm on the 7th and 8th covered the ground in most of the Midwest, the Middle Atlantic States, and parts of the Virginias, with 2 to 5 inches of snow that remained on the ground until the 10th. In New York State depths of a foot or more occurred during locally heavy snows near the Great Lakes from the 5th through the 10th. In the northern Great Plains and upper Mississippi Valley the snowcover was sufficient to protect the legume and winter grain crops from the severe cold spell on the 7th and 8th. On the 14th and 15th, 6 to 8 inches of snow fell in the central portions of the Dakotas and did not entirely disappear until the 20th. However, abnormally high temperatures generally prevailed after the 10th, and the snowcover steadily retreated northward with only patches remaining

around the western end of Lake Superior and in mountainous areas of northern Maine at the end of the month.

In the far West snowfall generally was much below normal at lower elevations where the ground remained bare most of the month. In mountainous areas above-normal amounts were reported in northern California, much of southern and eastern Oregon, and in a belt extending from central Colorado northwestward along and slightly west of the Continental Divide. At the end of the month the mountain snowpack was about normal in most northern sections but considerably below in the south.

**DESTRUCTIVE STORMS.**—Frequent severe local storms east of the Rocky Mountains during the period March 12 to 15, killed 4 persons, injured about 50, and caused over \$3,500,000 damage. Of these totals, 3 deaths, 23 injuries and over \$2,500,000 damage occurred in southern Oklahoma on the 13th when that area was swept by high winds, hail, heavy rains, and at least 6 tornadoes. Fifteen other States reported damage during this (12th to 15th) period.

Storms were widespread in the central interior during the passage of a cold front on the 21st and 22d. On the 21st tornadoes, wind, and hail caused 2 deaths, 3 injuries, and \$450,000 property loss in Minnesota, and 2 injuries and over \$400,000 damage in Iowa. On the 22d tornadoes and severe thunderstorms in south-central areas destroyed property valued at well over \$2,000,000. On this date the worst tornado of the month swept across northern Louisiana, leaving 2 persons dead and 22 injured, and destroying property valued at \$760,000, and severe thunderstorms accounted for more than \$1,000,000 damage in Mississippi, and \$435,000 in Arkansas. In the south-central interior on the 31st scattered storms, consisting of severe thunderstorms and a tornado, caused losses totaling over \$300,000.

# CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

MARCH 1953

Section	Temperature								Precipitation							
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes					
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least		
	*F	*F		*F			*F		In.	In.		In.		In.		
Alabama	58.9	+3.0	Tuskegee	88	31	Madison	23	5	3.65	-2.45	Youngs Store	9.01	Ft. Morgan	1.57		
Arizona	51.2	+4.8	Gila Bend	97	28	Maverick	-18	1	.89	-.06	McNary	4.38	2 Stations	.05		
Arkansas	56.2	+3.8	Crossett	90	18	Devils Knob	20	4	7.37	+2.61	Sugar Grove	11.65	Boughton	3.63		
California	50.8	-.6	Elythe	97	27	Soda Springs	-9	14	2.32	-1.01	Gasquet RS	13.10	4 Stations	.00		
Colorado	38.1	+3.7	Eversoll Ranch	87	28	Taylor Park	-28	4	1.09	-.27	Wolf Creek Pass 4W	4.99	Wray	T		
Connecticut	38.6	+2.8	Kent	70	23	Norfolk 28W	2	11	10.14	+6.02	Wolcott Rsvr.	15.86	2 Stations	8.01		
Delaware	44.9	+1.3	Georgetown	72	14	Newark College Farm	14	9	5.25	+1.39	Wilmington City Hall	6.27	Laurel 2SW	4.43		
Florida	68.9	+3.5	Stuart	92	19	Glen St. Mary	32	6	2.96	-.40	Ft. Pierce	9.83	Big Pine Key Inn	.05		
Georgia	59.2	+2.2	2 Stations	89	31	La Payette	20	7	3.61	-1.41	Tray Mountain	7.38	2 Stations	1.33		
Idaho	37.3	+1.6	Riggins RS	79	24	Island Park Dam	-23	3	1.20	-.48	Roland W. Portal	4.22	Hamer 4NW	.16		
Illinois	42.7	+1.7	E. St. Louis Parks C.	80	21	2 Stations	2	9	4.61	+1.41	Cairo WB City	7.77	Freeport Sewage Pl.	1.76		
Indiana	42.4	+1.9	2 Stations	79	22	Winamac	-1	8	4.33	+6.00	Rockville	8.16	Albion	1.53		
Iowa	36.7	+1.0	Le Claire L&D 14	80	21	5 Stations	0	4	2.92	+1.23	Donnellson 4N	5.99	Waukon	1.27		
Kansas	47.5	+3.4	3 Stations	88	20	Alton 6E	2	4	2.03	+.62	Burlington	5.81	Richfield 8SW	.39		
Kentucky	48.8	+2.3	Mt. Sterling	80	21	Grayson	19	10	5.49	+.69	Murray	9.72	Freeburn	2.26		
Louisiana	65.0	+5.1	West Monroe	91	19	Plain Dealing	29	5	5.17	+.47	Winnfield	10.23	Hackberry	.83		
Maine	31.4	+2.3	Bangor	74	23	Ft. Kent 1SE	-22	5	8.26	+4.75	North Bridgeton	12.03	Ft. Fairfield	5.03		
Maryland	45.1	+2.3	Brookside Manor	74	14	Savage River Dam	10	3	5.94	+2.34	Waterloo Police Brks.	8.60	Ocean City	E3.32		
Massachusetts	37.7	+2.5	6 Stations	70	23	West Cummington	-3	11	8.27	+4.34	Boston WB AP	11.00	North Truro	4.84		
Michigan	33.1	+3.5	2 Stations	75	21	Kenton U.S. Forest	-30	7	2.12	+.08	Adrian	3.65	Wackinaw City L.H.	.59		
Minnesota	28.2	+2.3	Preston	72	21	Big Falls RS	-35	7	1.37	+.17	Benson	2.73	Caribou 2S	.37		
Mississippi	60.7	+3.7	Port Gibson	87	18	Ripley	28	5	5.70	-.30	Holcomb	11.52	Crandall 12N	3.05		
Missouri	47.2	+2.7	Versailles	85	20	Maryville	4	4	4.51	+1.24	Caruthersville	9.35	Sullivan	2.43		
Montana	33.9	+3.1	Hysham	78	28	Thoeny	-30	6	.64	-.22	Summit	3.20	Belfry 8SSW	T		
Nebraska	41.3	+4.9	Pawnee City	84	20	2 Stations	-3	3	1.01	-.12	Auburn	2.61	Box Butte Exp. Farm	.09		
Nevada	42.4	+4.9	Overton	90	28	do	-8	2	.38	-.53	Glenbrook	1.72	Sarcobatus	.00		
New Hampshire	33.4	+4.3	Durham	70	23	First Conn. Lake	-22	8	7.86	+4.53	Pinkham Notch	13.43	Whitefield	3.23		
New Jersey	42.4	+2.9	Hamonton	74	23	2 Stations	8	9	6.99	+3.15	Paterson	10.35	Layton 3NW	4.47		
New Mexico	46.9	+2.7	2 Stations	89	27	Gavilan	-22	4	.68	.00	Hood Ranger Sta.	2.51	Afton 5ESE	.00		
New York	35.3	+3.0	do	73	22	3 Stations	-24	2	4.37	+1.27	White Plains AP	11.44	Frankfort	2.01		
North Carolina	51.9	+1.4	Whiteville	82	14	Waynesville 1E	14	27	4.36	+.20	Bluff	11.33	Wanteo	1.58		
North Dakota	26.2	+1.5	2 Stations	67	22	Medora 4NNE	-27	8	.95	+.17	Selfridge 11W	2.56	Colgate	.05		
Ohio	42.0	+2.9	do	79	21	Barnesville Wtr. Wks.	3	9	2.67	-.78	Portsmouth	5.48	Thornville	.78		
Oklahoma	55.4	+4.6	do	91	20	Kenton	11	4	3.68	+1.40	Fanshawe	11.08	Guymon	.16		
Oregon	40.9	-.9	Powers	81	8	Chemult	2	2	3.17	+.27	Valsetz	15.90	00 Raach	.19		
Pennsylvania	39.8	+2.1	Devault 1W	74	23	Lawrenceville 2S	-3	2	4.66	+1.11	Chadds Ford	7.55	Orwell 3N	2.45		
Rhode Island	39.3	+2.7	Providence WB City	68	23	Greenville	6	11	8.22	+4.11	Austin	10.62	Block Island WB AP	6.52		
South Carolina	55.9	+1.0	Bamberg	86	14	2 Stations	23	27	4.61	+.56	Sassafras Mtn.	9.20	Crescent	1.86		
South Dakota	33.3	+2.0	Delriehs	76	28	Ralph	-24	6	1.26	+.15	Milesville 5NE	3.36	Rumford	.09		
Tennessee	52.1	+2.6	9 Stations	79	13	3 Stations	22	1	6.11	+.71	Newbern	11.80	Roan Mtn.	2.38		
Texas	62.6	+5.0	Rio Grande City	101	22	Stratford	10	4	1.80	+.03	Center	11.12	3 Stations	.00		
Utah	40.5	+2.3	2 Stations	85	27	Bryce Canyon CAA AP	-10	2	.90	-.46	Alta	9.55	2 Stations	.00		
Vermont	32.5	+3.6	Enosburg Falls	71	23	West Burke	-17	11	4.82	+1.88	Ways Mill	11.34	Enosburg Falls	2.20		
Virginia	47.0	+1.3	2 Stations	78	14	Big Meadows	7	9	4.75	+1.11	Meadows of Dan 5SW	9.63	Wallaceton Lake	1.87		
Washington	42.1	+6.0	do	75	9	Chesaw	4	1	2.65	-.36	Forks 1E	15.28	Wapato	.03		
West Virginia	43.8	+1.3	Brownsville	82	21	Grafton	5	9	4.00	+.09	Pickens 1	6.93	Cranberry Glades	2.23		
Wisconsin	30.7	+2.2	Richland Center	78	21	2 Stations	-30	7	1.84	+.22	Gays Mills 1W	3.75	Shawano	.93		
Wyoming	34.2	+4.3	2 Stations	79	28	Bondurant	-31	3	.56	-.22	Moose 3NW	3.58	5 Stations	T		
*Alaska	-7.0	-7.7	Cape Decision	56	9	Ft. Yukon CAA	-66	25	.86	-.97	Beaver Falls	11.35	3 Stations	.00		
**Hawaii	69.1	+4	Puunene CAA AP	89	23	Kole Kole	29	15	5.39	-1.19	Kapoho Upper	18.20	Lahaina	.06		

° Other dates also.

\* January 1953.

\*\* February 1953.

E Water equivalent of snowfall wholly or partly estimated, using a ratio of 1 inch of water equivalent to every 10 inches of new snowfall.



## CLIMATOLOGICAL DATA

Table 2

MARCH 1953

State and station	Elevation (ft)	Pressure			Temperature										Precipitation										Wind				No. of days (sunrise to sunset)																																										
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days 0.1 inch or more	With thunderstorms	Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile	Direction	Speed	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine																																							
																					Total	Max. depth on ground																																																	
																																	M.	P.																																					
Fl.	Mb.	Mb.	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	%	In.	In.	In.	In.	In.	In.	In.	In.	M.	M.	M.	M.	0-3	4-7	8-10	0-10	%																																									
																																		ALABAMA																																					
Anniston	599	-----	1018.3	69	44	56.3	+2.6	81	2	31	29	0	4	45	3.84	-2.25	0.97	12	6	0.0	0	7.1	SW	*30	WSW	22	8	6	17	6.8	---	---																																							
Birmingham	610	993.6	1018.8	69	46	57.8	+4.0	81	2	32	26	0	1	44	66	4.31	-2.00	1.25	12	6	0	9.4	SE	47	W	22	7	5	19	7.0	50	---																																							
Mobile CO	10	1010.5	1018.7	73	56	64.7	+4.6	80	24	41	5	0	0	---	---	4.06	-3.06	2.03	10	2	0	11.6	---	50	NW	18	10	6	15	6.1	46	---																																							
Mobile	211	1010.5	1018.7	75	54	64.5	+5.0	81	22	39	5	0	0	54	77	4.42	-2.84	2.22	12	5	0	11.0	S	---	---	8	8	15	6.5	---	---																																								
Montgomery CO	201	1010.8	1018.5	72	52	61.7	+3.6	82	30	39	26	0	0	50	73	2.32	-4.18	1.13	14	4	0	6.1	NW	36	W	24	6	7	18	7.2	50	---																																							
Montgomery	198	1010.8	1018.5	72	49	60.5	+3.4	82	30	38	26	0	0	50	73	2.32	-4.18	1.13	14	4	0	6.1	NW	36	W	24	6	7	18	7.2	50	---																																							
																																		ARIZONA																																					
Flagstaff	6993	785.3	1017.4	51	21	36.1	+1.7	68	27	15	4	0	30	---	---	.87	-7.70	.78	5	2	7.3	8	---	---	---	---	14	5	12	4.9	---	---																																							
Phoenix CO	1093	974.6	1013.8	77	49	63.2	+2.3	81	27	38	4	0	1	0	---	---	.62	-.06	.48	2	0	0	6.5	---	29	W	20	17	9	5	3.3	85	---																																						
Phoenix	1014	974.6	1013.8	76	47	61.5	+1.6	89	27	35	4	0	0	38	45	.27	1	0	0	0	0	5.3	---	---	---	---	20	4	7	3.4	---	---																																							
Prescott	5014	845.6	1015.1	62	30	46.0	+1.2	77	27	17	4	0	0	20	19	40	.35	-.60	.12	3	1	3.2	1	10.8	SW	36	SW	20	14	10	7	3.9	87																																						
Tucson	2558	925.2	1013.2	75	46	60.6	+2.7	90	27	33	4	1	0	0	30	35	.60	-.08	.39	6	1	0	7.2	SE	33	S	29	14	8	9	4.5	81																																							
Winslow	4880	850.3	1013.7	63	31	46.7	+1.2	78	25	13	4	0	0	19	18	27	.07	-.33	.07	1	1	0	9.7	W	*47	WSW	20	17	8	6	3.7	---																																							
Yuma	203	1008.5	1013.7	81	50	65.4	+1.9	93	23	36	3	5	0	29	30	.18	-.08	.18	1	0	0	7.9	WNW	40	NW	28	22	6	3	2.5	92																																								
																																		ARKANSAS																																					
Fort Smith	458	998.6	1015.7	68	43	55.4	+3.1	84	20	30	5	0	4	41	65	8.52	+5.43	3.62	12	9	0	9.5	ENE	32	W	24	13	8	10	4.9	63	---																																							
Little Rock	257	1003.1	1016.2	67	47	57.1	+4.3	83	31	34	5	0	0	45	70	9.49	+4.42	2.46	13	9	0	9.2	SE	38	W	22	9	5	17	6.4	51	---																																							
Texarkana	361	1002.4	1015.9	72	50	60.9	+4.9	83	31	34	5	0	0	49	69	5.35	+4.42	1.84	15	6	0	8.8	SSE	*36	W	3	6	8	17	6.7	---	---																																							
																																		CALIFORNIA																																					
Bakersfield	489	1000.0	1016.4	70	42	56.0	-1.1	85	8	31	2	0	2	39	56	1.22	+1.11	.81	5	0	0	5.2	NW	*35	WNW	26	13	10	8	4.5	---	---																																							
Beaumont	2889	---	---	64	37	50.7	-2.0	80	24	21	2	0	0	---	---	1.41	-1.40	.80	4	0	5.5	4	---	---	---	---	16	7	8	3.8	---	---																																							
Bishop	4108	871.7	1012.5	77	49	63.2	+2.3	81	27	38	4	0	24	---	---	.27	1	0	0	0	0	5.3	---	---	---	---	17	9	5	3.3	---	---																																							
Blue Lake	5780	837.6	1016.4	47	30	38.5	-1.2	66	23	16	1	0	0	---	---	11.50	+4.04	3.33	11	0	80.6	32	---	---	---	---	15	4	12	4.8	---	---																																							
Barstow	699	990.2	1016.4	70	43	56.8	-1.1	88	23	33	2	0	0	38	56	.26	-1.99	.23	3	0	0	4.4	S	*27	NW	21	18	6	7	3.7	---	---																																							
Evansville CO	43	1017.6	1020.0	53	41	47.2	-1.9	69	7	34	2	0	0	---	---	5.95	+1.31	1.54	19	0	0	8.8	---	48	SW	19	5	12	14	6.5	52	---																																							
Emery	251	1005.8	1017.7	67	39	53.3	-2.2	83	8	26	2	0	4	40	65	.59	-1.04	.28	5	0	0	7.2	NW	25	SE	19	16	10	5	3.8	87	---																																							
Los Angeles CO	312	---	---	69	49	58.9	0	86	23	38	2	0	0	---	---	.48	-1.86	.35	3	0	0	6.4	---	---	---	---	1	18	7	6	3.6	84	---																																						
Los Angeles	99	1012.9	1016.4	65	48	56.4	-1.1	80	23	38	2	0	6	45	68	.44	-1.47	.30	3	0	0	7.1	WSW	*42	W	1	15	10	6	3.8	---	---																																							
Mar Shasta	3543	---	---	1	50	40.1	-1.6	70	4	18	17	0	2	43	73	6.49	+2.41	2.28	11	0	44.5	10	---	---	---	---	1	3	17	6.1	---	---																																							
Oakland	9	1018.6	1018.4	63	47	52.4	-1.0	78	23	32	3	0	1	43	73	1.73	-.59	1.08	3	0	0	7.5	---	*32	W	19	15	7	9	4.1	---	---																																							
Red Bluff	341	1004.7	1017.4	65	42	53.5	-1.8	81	5	32	1	0	2	34	52	.25	-2.06	.35	2	0	0	7.1	SSE	63	SE	19	14	6	11	5.0	80	---																																							
Sacramento	17	1016.9	1017.9	66	40	52.6	-1.3	81	7	31	2	0	0	50	65	1.22	-.67	.61	5	0	0	10.0	SE	49	S	19	17	9	5	3.4	68	---																																							
Sandberg CO	4517	862.2	1016.1	34	30	44.5	-2.7	70	24	20	2	0	10	28	54	.42	-1.39	.31	6	0	9	1	18.8	NW	---	---	15	6	10	3.9	---	---																																							
San Diego	19	1013.5	1016.8	66	49	57.7	-1.5	83	23	43	3	0	0	45	65	.76	-.73	.59	4	0	0	5.8	W	29	SW	1	16	11	4	3.2	77	---																																							
San Francisco CO	92	---	---	68	47	53.5	-1.7	78	7	40	1	0	1	---	---	1.83	-.95	.74	9	0	0	8.6	---	---	---	---	36	19	18	3	10	4.0	76	---																																					
San Francisco	1	1018.3	1018.8	60	42	50.2	-1.4	77	7	33	3	0	0	62	75	1.35	-1.10	.86	9	0	0	11.8	WNW	41	WNW	28	15	6	10	4.3	---	---																																							
Santa Catalina	1569	959.4	1019.2	60	47	53.5	-1.4	77	7	33	3	0	0	---	---	.94	-.94	.51	4	0	0	---	---	---	---	---	12	4	7	3.7	---	---																																							
Santa Monica	231	1009.5	1018.1	67	47	52.1	-1.5	84	7	33	2	0	0	47	68	.92	-1.28	.42	5	0	0	8.2	W	*23	N	22	16	7	6	3.6	---	---																																							
																																		COLORADO																																					
Alamosa	7503	768.8	1016.7	60	17	32.1	-3.7	66	2	12	4	0	0	---	---	.26	-1.17	.15	4	1	3.4	1	---	---	---	---	12	11	8	4.5	---	---																																							
Colorado Springs	6727	807.1	1013.9	60	35	40.8	-4.4	71	28	11	5	0	26	15	37	.73	-.48	.13	3	0	2.7	2	13.3	NNW	*42	SEW	20	13	8	10	4.9	---	---																																						
Denver	5221	834.7	1017.5	68	29	43.6	-1.8	75	18	15	3	0	24	18	47	1.17	-.04	.04	7	0	11.8	6	9.2	S	49	NW	21	9	14	8	5.2	74	---																																						
Grand Junction	4329	857.8	1014.7	58	30	43.1	-1.9	75	18	15	3	0	20	21	47	1.20	-.63	.60	9	1	8.7	0	8.6	FSK	49	W	3	13	7	11	5.1	63	---																																						
Pueblo	4799	853.6	1013.1	62	30	44.7	-1.7	75	18	15	3	0	20	18	50	.97	-.63	.06	2	0	4	0	9.2	WNW	56	SW	20	14	7	10	4.8	82	---																																						
																																		CONNECTICUT																																					
Bridgewater	9	1016.3	1017.0	48	35	46.4	+3.5	63	2	30	11	0	34	36	71	9.45	+5.80	2.74	15	1	1.0	1	11.0	WSW	*40	SSE	4	6	8	17	7.0	---	---																																						
Hartford	1	1010.8	1017.0	68	52	59.7	+2.6	66	23	14	2	8	14	28	69	9.15	+5.69	2.42	16	0	0	9.1	N	34	S	24	5	6	20	7.3	49	---	---																																						
New Haven	0	1012.5	1016.5	68	52	59.1	+2.0	62	23	13	1	6	24	---	---	7.78	+6.66	3.																																																					



## CLIMATOLOGICAL DATA

Table 2—Continued

MARCH 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation					Wind					No. of days (sunrise to sunset)		Possible sunshine								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max. 90° F or above Min. 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days .01 inch or more With thunderstorms	Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		to sunset									
																			Total	Max depth on ground			Speed	Direction			Date	Clear	Partly cloudy	Cloudy				
	ft.	mb.	mb.	°F.	°F.	°F.	°F.	°F.	°F.	°F.		°F.	%	in.	in.	in.	in.	in.	in.	in.	in.	M. p. h.	M. p. h.		0-3	4-7	8-10	%						
INDIANA																																		
Evansville	383	1001.7	1017.7	58	38	47.8	+1.2	75	21	24	9	0	12	38	73	4.43	+0.14	1.56	12	6	1.2	1	11.7	WNW	45	S	21	6	11	14	6.8	54		
Fort Wayne	801	984.4	1016.4	47	30	38.7	+1.9	74	21	6	8	0	17	31	75	4.24	+1.08	2.15	14	3	3.8	3	12.3	W	40	S	21	3	5	23	8.2	44		
Indianapolis	793	987.1	1017.1	52	32	42.1	+2.0	77	21	11	9	0	17	34	75	5.41	+1.52	2.01	13	4	7.5	5	13.3	WNW	49	NW	3	7	6	18	7.1	48		
South Bend	768	988.2	1016.7	46	30	37.8	+2.1	75	21	5	7	0	19	30	75	2.52	-.43	.92	11	2	2.4	2	13.2	WNW	45	SW	22	2	5	24	8.4	—		
Terre Haute	585	994.2	1017.2	52	34	43.0	+1.4	74	21	18	8	0	15	35	80	7.52	+3.61	2.51	12	4	7.6	7	12.3	S	43	SE	22	7	5	19	7.1	47		
IOWA																																		
Burlington	694	990.2	1016.5	48	29	38.8	+3	75	21	12	7	0	18	30	74	3.54	+7.3	1.39	16	6	5.6	5	12.5	WNW	42	SW	23	6	8	17	7.0	55		
Charles City CO	1013	979.0	-----	43	26	34.2	+1.5	71	21	9	4	0	23	---	---	1.88	-.16	.59	13	1	4.2	3	7.8	---	34	S	21	8	8	15	6.5	43		
Davenport CO	579	-----	-----	46	30	38.1	.0	75	21	14	7	0	18	---	---	2.35	-.38	.90	12	4	5.8	3	---	---	---	---	---	---	---	---	---	---	---	
Des Moines	948	984.1	1016.5	47	29	38.1	+1.1	76	21	12	4	0	20	29	73	2.37	+3.4	1.32	13	3	2.4	2	14.4	NW	56	S	21	4	8	19	7.3	49		
Dubuque	1065	976.0	1016.2	42	26	34.0	+7	74	21	6	7	0	22	26	78	3.88	+1.63	1.05	14	3	7.6	4	---	---	---	---	---	---	---	---	---	---	---	
Sioux City	1093	973.2	1015.8	48	27	37.2	+2.2	68	17	9	4	0	22	28	74	1.98	+7.2	1.18	11	5	1.4	1	10.7	NW	41	W	18	6	10	15	6.8	55		
KANSAS																																		
Concordia CO	1375	964.8	-----	55	35	45.2	+3.6	81	20	12	4	0	9	---	---	1.86	+5.3	.53	8	5	9.0	7	---	---	---	---	---	---	---	---	---	---	---	
Dodge City	2594	925.2	1013.6	60	36	47.8	+5.2	84	20	19	4	0	9	29	58	1.14	-.01	.95	6	1	.7	1	16.9	SSE	37	NW	21	6	11	14	6.6	44		
Goodland	3645	885.2	1013.3	58	26	42.3	+5.8	77	28	5	3	0	25	22	53	1.20	+1.1	.75	4	1	7.1	6	15.0	NW	43	NNW	21	9	10	12	5.6	—		
Topeka	879	979.3	1015.7	57	33	45.0	+2.4	85	20	14	4	0	17	34	69	3.10	+1.07	1.19	11	3	11.3	9	10.7	NNW	47	SW	21	6	9	16	6.7	55		
Wichita	1372	965.1	1014.3	59	39	49.4	+4.1	83	20	19	4	0	7	34	63	3.35	+1.61	1.88	9	1	.7	1	15.4	S	41	SW	21	8	9	14	6.2	62		
KENTUCKY																																		
Lexington	979	981.4	1017.6	56	37	46.7	+4.3	73	21	23	8	0	13	36	71	7.84	+3.38	2.71	15	4	2.2	1	13.9	SSE	---	---	---	---	---	---	---	---	---	
Louisville CO	457	-----	-----	57	41	48.9	+2.8	74	21	26	8	0	6	---	---	5.12	+4.5	2.01	14	2	3.1	1	---	---	---	---	---	---	---	---	---	---	---	
Louisville	485	1000.3	1016.9	57	38	47.7	+2.1	74	21	25	8	0	11	37	69	4.71	+0.4	1.87	12	3	3.1	1	9.9	SE	47	S	3	7	7	17	6.8	45		
LOUISIANA																																		
Baton Rouge	64	1013.9	1016.9	76	56	66.3	+6.0	84	2	38	5	0	0	56	73	5.17	-.65	3.45	8	4	.0	0	9.1	SE	---	---	---	---	---	---	---	---	---	
Lake Charles	12	1014.6	1016.6	76	59	67.4	+6.8	83	31	43	5	0	0	59	79	1.03	-.37	.76	6	3	.0	0	9.8	S	*35	SW	2	5	5	21	7.5	—		
New Orleans CO	9	1015.6	-----	76	60	68.0	+5.0	82	2	47	5	0	0	---	---	4.46	-2.10	3.20	8	4	.0	0	6.9	---	27	SE	3	6	4	21	7.2	59		
New Orleans	3	1015.2	1017.4	76	58	67.1	+5.4	83	2	44	6	0	0	57	74	3.53	-2.37	2.70	7	4	.0	0	10.3	S	*37	SSW	3	6	6	19	7.0	—		
Shreveport	252	1006.4	1016.0	73	53	63.2	+5.3	86	18	36	5	0	0	52	71	4.61	-.09	1.88	10	6	T	T	9.9	S	---	---	---	---	---	---	---	---	---	
MAINE																																		
Caribou	624	993.6	1017.6	33	18	25.2	+3.5	56	23	-7	9	0	25	17	71	5.13	+2.73	1.10	15	0	33.1	27	11.7	NW	*38	NW	9	5	8	18	7.3	—		
Eastport CO	33	1013.9	1016.9	39	26	32.3	+1.6	56	23	2	11	0	22	---	---	7.42	+4.54	2.25	12	0	3.8	1	14.2	---	66	E	14	8	8	15	6.6	43		
Portland	61	1012.2	1016.1	43	26	34.4	+2.9	66	23	-1	11	0	21	27	76	9.97	+5.94	2.50	14	0	3.7	1	12.5	N	46	E	26	10	2	19	6.5	48		
MARYLAND																																		
Baltimore CO	14	-----	-----	54	40	46.7	+1.4	70	13	21	2	0	7	---	---	6.57	+2.94	1.44	12	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Baltimore	146	1012.9	1017.7	55	37	45.5	+1.7	71	14	19	9	0	8	33	65	6.80	+3.17	1.63	14	1	3.6	3	12.2	NW	46	W	5	10	7	14	6.1	45		
Frederick	294	-----	-----	53	33	42.6	-.7	61	14	18	9	0	15	---	---	4.48	+1.17	1.02	14	---	6.0	3	---	---	---	---	---	---	---	---	---	---	---	
MASSACHUSETTS																																		
Blue Hill Obs.	640	992.0	-----	46	29	36.4	+2.3	67	23	6	11	0	17	---	74	9.53	+5.67	2.57	12	0	.6	1	16.4	NW	47	SSE	4	8	6	17	6.7	38		
Boston	12	1011.2	1016.0	46	32	39.1	+1.6	69	23	10	11	0	11	27	67	11.00	+7.57	3.10	14	0	.2	T	14.0	NW	35	NW	5	9	4	18	6.9	42		
Nantucket	43	1015.6	1016.3	43	33	37.9	+1.3	54	26	16	11	0	12	32	80	6.22	-2.17	1.71	13	2	.3	T	14.1	WNW	44	S	4	6	6	19	7.0	48		
Pittsfield	1153	972.6	1015.9	42	26	34.1	+3.3	64	23	3	11	0	21	---	---	6.83	+3.61	1.38	15	0	4.8	2	---	---	---	---	---	---	---	---	---	---	---	---
MICHIGAN																																		
Alpena CO	587	993.2	-----	36	25	30.4	+2.7	55	23	1	8	0	26	---	---	2.45	-.41	.64	19	0	6.9	5	12.1	---	---	---	---	---	---	---	---	---	---	
Detroit	619	989.5	1016.8	45	31	37.9	+2.8	61	22	14	7	0	15	29	73	2.96	+4.1	1.80	15	1	1.0	7	11.3	W	45	NW	18	3	4	26	8.6	32		
Escanaba CO	594	992.9	-----	36	24	29.6	+3.4	49	27	1	7	0	26	---	---	2.01	-.23	.71	11	2	4.5	15	11.0	---	---	---	---	---	---	---	---	---	---	
Grand Rapids	681	990.5	1016.4	44	28	36.1	+3.6	73	21	6	7	0	22	28	75	1.90	-.45	.57	12	1	4.9	2	11.6	W	46	SW	23	1	4	26	8.6	31		
Lansing	859	983.7	1016.7	43	29	36.0	+2.8	68	21	9	7	0	21	28	77	2.29	-.28	.90	16	1	2.5	2	14.8	WNW	57	SE	23	1	6	24	8.5	26		
Marquette CO	677	987.8	-----	37	24	30.4	+3.5	59	22	5	7	0	25	---	---	2.58	+1.01	.60	10	14.0	29	9	---	---	---	---	---	---	---	---	---	---	---	
Muskegon	627	992.6	1016.3	43	28	35.4	+3.0	72	21	7	8	0	21	28	76	1.84	-.34	.43	12	2	7.7	4	10.8	WNW	*30	W	4	4	25	8.1	42			
Sault Ste. Marie	721	992.6	1016.2	34	21	27.2	+4.2	48	31	-3	8	0	28	22	80	2.26	+4.1	.54	15	1	16.8	31	10.1	E	38	SW	23	3	4	24	8.1	33		



## CLIMATOLOGICAL DATA

Table 2—Continued

MARCH 1953

State and station	Pressure						Temperature										Precipitation						Wind						No. of days (sunrise to sunset)					
	Feet (ground)	Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point	Average relative humidity		Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail	Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile		to sunset)		Sky cover, tenths (sunrise to sunset)	Possible sunshine			
												Max. 90° F. or above	Min. 32° F. or below		%	in.				in.	in.					of inch or more	With thunderstorms	Total	Direction			Date	Clear	Partly cloudy
NEVADA																																		
Elko	5075	843.2	1016.1	53	23	37.7	+1.6	72	27	10	2	0	29	21	56	0.32	-0.37	0.25	6	0	3.6	3	7.9	SW	*35	W	19	11	8	12	5.5	--		
Ely	6257	806.0	1015.5	51	19	35.1	-2.2	67	27	8	2	0	29	15	47	.52	-1.77	.31	3	2	2.8	2	13.2	---	45	W	19	14	6	11	4.9	71		
Las Vegas	2162	947.5	1012.8	72	41	56.4	-1.1	84	24	28	4	0	2	15	22	.03	-.32	.03	1	0	.0	0	8.0	SW	*45	SW	19	18	9	4	3.0	96		
Reno	4397	861.2	1016.8	57	24	40.3	-3.2	72	27	12	14	0	28	21	50	.34	-.36	.30	2	0	.4	1	8.3	WNW	49	SW	10	14	8	9	4.2	78		
Winnemucca	4299	866.9	1016.6	5	22	39.0	-4	74	24	5	2	0	28	21	50	.16	-.70	.15	3	0	1.4	3	9.3	---	50	---	---	---	---	---	---	---		
NEW HAMPSHIRE																																		
Concord	339	1005.4	1016.5	44	26	35.3	+3.5	67	23	5	11	0	20	26	73	7.81	+4.77	1.85	15	0	2.5	2	8.4	NW	34	NE	26	8	6	17	6.5	36		
Mt. Washington	6262	799.0	1005.5	21	9	14.8	+2.8	40	25	-25	10	0	31	--	84	7.29	+1.84	2.11	20	0	29.9	30	36.7	W	114	ESE	26	5	6	20	7.5	37		
NEW JERSEY																																		
Atlantic City CO	8	1014.6	1016.6	51	39	44.9	+3.4	66	13	20	9	0	7	--	--	5.60	+2.07	2.27	12	2	3.5	4	17.3	---	54	SE	24	7	10	14	6.4	54		
Newark	11	1015.9	1016.9	50	36	42.9	+2.4	68	14	18	8	0	9	33	69	8.49	+4.71	3.32	16	0	.8	7	10.1	NW	*31	NW	5	8	18	6.9	--			
Trenton CO	56	1009.8	1016.9	51	36	42.6	+2.3	68	23	18	8	0	10	--	--	7.53	+4.33	2.5	13	2	4.2	4	10.0	---	*38	NW	30	8	7	16	6.8	47		
NEW MEXICO																																		
Albuquerque	5310	847.6	1013.1	62	36	48.8	+2.8	77	27	19	4	0	10	22	41	.74	+3.30	.40	7	0	T	T	10.6	N	56	W	20	15	7	9	4.4	73		
Clayton	4969	844.6	1011.9	61	31	46.1	+4.6	77	28	12	4	0	10	--	--	.42	-.24	.40	3	0	.2	1	---	---	---	---	---	---	---	---	---	---	---	
Raton	6379	801.2	1011.7	58	24	41.1	+2.6	74	28	0	4	0	29	--	--	.79	-.55	.08	1	0	1.0	0	---	---	---	---	---	---	---	---	---	---	---	
Roswell	3612	891.3	1012.4	72	39	55.4	+4.7	86	26	18	4	0	6	22	32	.25	-.28	.23	2	1	.0	0	13.4	---	61	SW	1	16	6	9	3.9	--		
NEW YORK																																		
Albany	277	1012.9	1016.6	45	28	36.7	+3.6	68	23	4	2	0	18	28	73	5.74	+3.41	1.14	16	0	2.4	1	10.3	WNW	36	W	5	6	6	19	7.1	41		
Bear Mountain	1300	---	---	43	30	36.6	+1.3	60	23	9	2	0	14	--	--	8.71	+5.41	2.74	15	2	1.6	2	---	---	---	---	---	---	---	---	---	---	---	
Binghamton	1601	955.6	1016.2	41	26	33.6	+2.5	64	23	4	2	0	20	26	76	3.39	+4.40	.93	16	0	4.1	1	13.1	NW	45	NW	30	5	2	24	8.0	31		
Buffalo	693	988.2	1016.7	44	29	36.6	+3.6	68	23	6	2	0	17	30	79	3.76	+1.04	.88	18	2	5.5	2	15.1	SW	54	SW	4	2	7	22	8.1	29		
New York CO	10	1005.1	---	49	37	43.3	+2.6	64	24	18	8	0	9	--	--	7.91	+4.35	3.05	14	2	.9	1	14.7	---	56	W	5	7	9	15	6.6	46		
New York	19	1015.2	1016.9	50	37	43.4	+2.9	68	14	20	*8	0	8	31	66	8.73	+5.23	3.25	17	0	1.8	1	11.8	NW	50	SE	13	7	7	17	6.7	--		
Rochester	543	997.0	1016.6	45	29	36.8	+3.8	73	22	5	2	0	15	30	79	3.38	+4.42	1.21	17	1	3.0	5	12.5	W	59	W	5	4	5	22	7.7	38		
Schenectady	217	---	---	46	30	38.0	+5.5	68	23	8	2	0	14	--	--	4.86	+2.17	1.06	12	0	.3	T	---	---	---	---	---	---	---	---	---	---	---	
Syracuse	399	994.9	1017.4	45	29	36.8	+2.6	67	23	3	2	0	14	28	73	3.75	+5.1	1.22	20	1	9.2	4	11.5	WNW	43	S	4	6	4	21	7.6	44		
NORTH CAROLINA																																		
Asheville CO	2203	---	---	60	38	49.2	+2.4	75	18	27	9	0	8	--	--	2.10	-1.47	.53	15	0	T	0	10.7	---	44	SE	4	7	10	14	6.5	59		
Asheville	2093	943.4	1018.0	---	---	---	---	---	---	---	---	---	---	26	48	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Charlotte	753	989.8	1017.8	64	42	52.7	+1.7	79	14	30	*3	0	6	39	65	5.06	+4.97	1.61	13	1	T	T	7.3	NE	30	SW	15	9	6	16	6.3	59		
Greensboro	891	986.1	1018.6	61	38	49.2	+1.0	76	14	25	9	0	10	37	68	4.96	+1.31	1.39	14	2	T	T	9.5	NW	28	NW	4	11	8	12	5.6	52		
Hatteras	4	1016.9	1017.6	61	49	54.6	+1.9	68	15	33	9	0	0	46	76	4.41	+5.2	1.97	15	2	.0	0	13.4	SSW	40	W	8	10	8	13	6.2	51		
Raleigh CO	400	---	---	62	42	52.1	+1.8	77	14	28	*3	0	5	--	--	5.36	+1.78	1.93	12	1	.0	0	7.2	---	29	NW	25	11	6	14	6.0	49		
Raleigh	438	1002.0	1017.9	62	40	51.3	+1.2	77	14	28	*3	0	6	39	68	4.43	+7.7	1.30	11	1	.0	0	8.6	NW	---	---	---	---	---	---	---	---	---	
Wilmington	36	1016.6	1017.8	67	46	56.5	+1.8	79	19	31	9	0	2	49	79	4.14	+6.9	1.57	10	4	.0	0	10.8	SSW	38	W	4	11	7	13	5.7	53		
Winston-Salem	967	950.6	1017.7	61	40	50.4	+1.9	75	14	26	*3	0	5	35	62	5.16	+1.33	1.86	14	2	T	T	9.5	NE	45	W	15	10	8	13	5.7	--		
NORTH DAKOTA																																		
Bismarck	1650	952.9	1015.3	37	16	26.4	-5	65	29	-16	6	0	30	20	78	1.77	+1.01	.79	13	0	17.5	7	12.9	ESE	56	W	18	5	10	16	7.0	47		
Devils Lake CO	1471	960.0	---	34	15	24.6	+2.0	57	20	-14	6	0	30	--	--	.60	-.13	.30	9	0	6.3	3	9.9	---	27	NW	18	4	9	18	7.2	57		
Fargo	895	980.0	1015.7	37	19	28.0	+2.7	53	17	-6	6	0	29	21	76	-.46	-.43	.21	7	0	4.6	2	14.1	SE	42	SW	22	5	10	16	7.0	49		
Williston CO	1877	944.8	1014.3	38	18	28.1	+1.6	61	28	-13	6	0	26	20	72	.99	+2.4	.34	9	0	12.7	4	8.6	---	43	W	18	6	3	22	7.6	56		
OHIO																																		
Akron	1210	978.7	1017.6	47	29	38.2	+1.7	71	21	4	8	0	22	31	78	2.62	-.54	.85	19	2	2.	2	11.4	NW	---	---	---	---	1	6	24	8.5	--	
Cincinnati Obs.	761	---	---	55	37	45.9	+2.6	76	21	21	8	0	12	--	--	2.70	-1.37	.93	16	2	6.3	5	10.1	---	38	S	3	--	--	--	--	45		
Cincinnati	771	984.8	1017.2	54	36	44.6	+2.9	74	21	21	8	0	13	32	67	2.73	-1.31	.93	13	1	4	12.2	WNW	---	---	---	---	---	5	7	19	7.4	--	
Cleveland CO	663	---	---	48	34	41.0	+3.3	72	21	21	8	0	10	--	--	1.88	-1.08	.51	19	--	---	---	---	---	---	---	---	---	---	---	---	---	---	
Cleveland	787	985.8	1016.9	48	32	40.0	+3.2	72	21	18	*8	0	16	31	74	2.05	-.84	.58	22	2	.5	3	10.9	---	63	W	4	2	5	24	8.4	27		
Columbus CO	724	---	---	50	36	43.0	+1.9	73	21	16	8	0	8	--	--	1.17	-.55	.16	3	--	---	---	---	---	---	---	---	---	---	---	---	---	---	
Columbus	815	986.8	1017.3	52	33	42.5	+2.7	74	21	13	8	0	14	33	72	1.49	-1.94	.48	16	2	3.9	3	10.0	WNW	42	S	3	0	10	21	8.4	35		
Dayton	1062	980.0	1017.2	51	33	42.1	+2.3	74	21	13	8	0	14	32	72	2.98	-.26	1.21	13	3	4.2	3	11.1	WNW	51	W	4	2	8	21	8.3	32		
Sandusky CO	603	993.9	---	48	34	40.9	+3.4	74	21	20	7	0	10	--	--	2.03	-.86	1.21	13	2	.7	1	10.2	---	54	SW	3	1	6	24	8.5	28		
Toledo	621	992.9	1016.9	48	31	39.3	+3.5	76	21	12	8	0	17	30	74	2.13	-.73	1.20	11	3	.8													



## CLIMATOLOGICAL DATA

Table 2—Continued

MARCH 1953

State and station	Elevation (ground)	Pressure			Temperature										Precipitation						Wind			No. of days		Possible sunshine						
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max. 90° F. or above Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days 0.1 inch or more With thunderstorms	Snow, Sleet, Hall		Average hourly speed	Prevailing direction	Fastest mile	to sunset)								
																			Total	Max. depth on ground				(sunrise								
																								Clear	Cloudy							
S. CAR. (Cont.)																																
Florence	146	1012.2	1017.6	58	45	56.7	+1.3	82	31	32	27	0	1	---	3.60	+0.06	1.72	13	1	0.0	0	---	---	---	---	6	10	15	6.4	---		
Greenville	1006	979.7	1017.2	64	43	53.7	+2.2	78	31	33	27	0	0	38	63	4.47	-.04	1.33	14	5	0	9.6	NE	36	N	10	13	6.3	53			
Spartanburg	801	988.2	1018.0	64	43	53.4	+1.7	78	14	32	5	0	2	---	4.69	+.20	1.73	13	1	0	---	---	---	---	9	8	14	6.0	---			
SOUTH DAKOTA																																
Euroa	1282	966.8	1015.2	42	23	32.2	+	5	69	17	-2	6	0	27	24	74	1.45	+.36	.96	9	1	7.7	13.1	SSE	68	NW	18	5	11	15	6.4	55
Rapid City	3165	897.4	1013.6	49	24	36.7	+5.4	67	29	3	2	0	27	22	60	.66	-.40	.61	3	1	8.4	14	NW	65	NW	23	9	10	12	5.5	70	
Sioux Falls	1420	964.8	1015.8	43	23	32.8	+.8	65	20	-1	6	0	24	23	70	1.86	+.51	.72	13	2	12.1	9	NW	45	N	18	7	4	20	7.1	---	
TENNESSEE																																
Bristol	1519	963.1	1017.9	60	38	49.0	+2.3	77	14	26	9	0	10	37	55	4.01	+.24	1.00	14	3	0	7.0	W	27	NW	4	6	10	15	6.5	---	
Chattanooga	670	990.2	1018.2	64	42	53.0	+2.3	78	18	29	27	0	3	41	70	3.96	-2.09	1.08	14	4	0	5.8	SSW	38	NW	28	8	7	16	6.6	43	
Knoxville	949	982.4	1018.2	64	41	52.3	+2.9	76	14	28	27	0	3	40	67	4.22	-.61	1.30	13	3	0	8.7	NE	49	SW	3	8	6	17	6.7	49	
Memphis CO	271	---	---	65	49	56.9	+.5	79	20	34	8	0	0	---	---	9.23	+4.03	3.52	14	---	---	---	---	---	---	---	---	---	---	---		
Memphis	263	1002.0	1016.9	66	47	56.5	+4.5	79	20	35	8	0	0	45	69	8.91	+3.32	2.81	14	7	0	10.8	SE	35	S	3	8	7	16	6.4	52	
Nashville	577	997.6	1017.7	63	43	52.9	+3.1	75	20	28	9	0	4	41	70	5.52	+.24	1.51	11	6	0	7.5	SSE	70	NW	31	9	3	19	6.8	50	
Oak Ridge	903	---	---	63	39	50.8	+2.8	75	14	26	27	0	9	---	---	4.94	-.26	1.27	13	2	0	---	---	---	---	8	8	17	6.5	---		
TEXAS																																
Abilene	1752	952.6	1013.6	73	49	61.0	+5.9	88	20	30	4	0	1	39	51	.91	-.21	.83	6	5	0	15.0	SSW	71	S	26	12	6	13	5.4	65	
Amarillo	3590	886.9	1012.2	68	38	52.9	+6.8	82	20	19	4	0	7	26	43	.38	-.66	.38	2	0	0	13.0	WSW	47	N	1	16	10	5	3.9	81	
Austin	615	993.9	1015.7	76	56	66.1	+5.8	86	1	37	5	0	0	54	71	1.73	---	.56	10	4	0	9.9	S	32	N	4	15	8	18	7.0	45	
Big Spring	2349	915.3	1013.1	73	48	60.7	+5.0	88	20	26	4	0	0	37	77	1.77	+.88	1.74	4	0	0	14.2	---	---	---	---	---	---	---	---		
Brownsville	16	1011.2	1013.6	82	67	74.9	+6.8	90	22	48	5	1	0	66	79	.26	---	.24	3	0	0	15.1	SSE	40	SE	19	5	11	15	6.7	52	
Corpus Christi	40	1013.2	1014.4	80	54	71.8	+7.5	90	1	46	5	0	0	65	88	.30	-1.33	.16	7	0	0	14.0	---	---	---	---	---	---	---	---		
Dallas	487	996.6	1015.2	73	51	61.7	+4.3	82	14	35	4	0	0	50	69	3.55	+.74	1.80	13	3	0	12.4	S	40	NW	1	11	7	13	5.6	61	
Del Rio	1091	979.0	1013.3	80	58	69.0	+6.1	89	18	40	5	0	0	49	57	1.70	+.77	1.62	3	4	0	7.2	ESE	38	NW	3	6	7	18	6.8	54	
El Paso	3920	880.5	1012.4	71	47	58.7	+4.2	86	28	27	5	0	2	27	33	.12	-1.66	.08	2	1	0	12.0	WSW	47	NW	26	17	4	10	4.2	77	
Fort Worth	688	990.5	1015.1	72	51	61.6	+5.1	82	14	35	4	0	0	45	60	2.52	+.15	1.64	11	5	0	14.3	---	---	---	---	---	---	---	---		
Galveston CO	7	---	---	71	63	66.8	+5.0	86	24	48	5	0	0	---	---	.06	-3.04	.03	3	0	0	12.2	---	---	---	---	---	---	---	---		
Galveston	7	1015.2	1016.2	71	62	66.7	+4.9	78	27	47	5	0	0	61	85	.14	-3.12	.05	5	1	0	10.9	---	---	---	---	---	---	---	---		
Houston CO	41	1010.5	---	77	62	69.4	+6.8	85	18	44	5	0	0	---	---	.14	-2.96	.07	5	0	0	10.5	---	---	---	---	---	---	---	---		
Houston	50	1012.9	1015.8	77	60	68.5	+6.9	85	18	42	5	0	0	59	77	.07	-2.71	.04	4	1	0	12.2	---	---	---	---	---	---	---	---		
Laredo	500	997.6	1012.8	80	65	75.4	+7.0	97	21	46	5	12	0	80	64	.45	-.45	.28	5	2	0	13.6	SE	32	SE	29	4	9	18	7.1	---	
Lubbock	3243	901.5	1012.6	70	40	55.2	+5.5	86	26	21	4	0	6	31	45	1.07	+.27	.62	4	1	0	15.5	SW	40	NW	21	16	11	7	3.7	---	
Port Arthur	16	1015.2	1016.4	76	58	67.4	+7.1	83	31	39	5	0	0	60	83	.28	-3.72	.14	4	2	0	11.3	SSW	29	S	17	4	7	20	7.5	49	
San Angelo	1903	946.8	1013.8	75	50	62.4	+4.2	88	20	32	4	0	1	42	52	5.00	+4.05	4.65	6	4	0	12.0	SSW	35	N	1	14	4	13	5.3	---	
San Antonio	782	986.5	1014.6	78	57	67.9	+6.5	80	18	38	5	1	0	53	68	.53	-1.59	.37	7	2	0	10.8	SE	40	NW	4	2	13	16	7.3	49	
Victoria	109	1009.8	1014.7	79	61	70.0	+6.1	86	18	38	5	0	0	61	81	.25	-2.39	.12	7	5	0	9.8	---	---	---	---	---	---	---	---		
Waco	504	996.3	1015.0	74	52	62.8	+4.4	83	31	36	4	0	0	51	70	.32	+2.27	1.54	11	8	0	9.4	S	---	---	---	---	---	---	---		
Wichita Falls	1027	977.3	1014.0	71	47	58.9	+5.9	87	20	30	4	0	1	41	57	1.90	+.29	.52	7	0	0	11.6	SE	35	NW	1	15	7	9	4.2	---	
UTAH																																
Milford	5028	844.6	1015.6	57	24	40.4	+1.2	75	27	12	3	0	28	---	---	1.23	---	1.16	3	0	5.0	1	---	---	---	13	10	5	16	5.1	---	
Salt Lake City	4222	865.9	1015.0	55	32	43.2	+2.1	73	27	19	3	0	21	26	55	.86	-.80	.16	8	0	10.1	4	10.8	SE	51	W	21	10	5	16	6.2	57
VERMONT																																
Burlington	331	1001.7	1016.6	42	26	34.0	+4.7	84	23	2	11	0	20	26	75	3.03	+.84	.72	17	0	.3	10.2	S	37	SW	4	7	6	18	6.8	41	
VIRGINIA																																
Cape Henry CO	16	1016.3	1016.9	57	44	50.7	+2.0	74	15	32	9	0	1	---	---	2.28	-1.08	.47	12	2	1.0	1	13.7	---	42	NW	8	9	8	14	5.9	57
Lynchburg	947	983.7	1018.0	57	38	47.2	+.8	72	14	24	2	0	10	33	62	4.82	+1.25	1.24	13	2	6.1	5	9.7	NWE	29	NW	6	8	8	14	6.1	55
Norfolk CO	11	1014.6	1016.8	60	44	52.3	+1.8	73	15	29	9	0	2	---	---	2.27	-1.00	.73	12	2	1.2	1	11.1	---	29	N	29	---	---	---	---	
Norfolk	25	1016.6	1018.0	60	43	51.2	+2.1	73	15	25	9	0	3	40	69	2.67	-.60	.73	12	2	.5	1	11.2	NE	---	---	---	---	---	---	---	
Richmond CO	162	---	---	59	40	49.2	+1.0	72	14	25	9	0	5	---	---	3.63	+.20	.75	11	---	---	---	---	---	---	---	---	---	---	---		
Richmond	160	1011.9	1018.0	59	38	48.3	+.3	72	14	24	9	0	8	36	69	3.95	+.53	.87	11	2	5.6	4	8.7	W	27	W	5	8	7	16	6.5	55
Roanoke	1174	975.3	1018.0	57	38	47.6	+1.3	74	31	25	10	0	8	32	60	5.13	+1.94	1.66	14	0	5.2	5	10.7	NW	---	---	---	---	---	---	---	
Washington CO	72	---	---	56	39	47.3	+1.5	71	14	23	2	0	7	---	---	7.07	+3.71	1.99	14	2	3.0	2	9.3	---	32	NW	25	---	---	---	---	
Wash. Nat'l. AP	14	1013.5	1017.9	56	39	47.5	+2.2	70	14	22	2	0	5	33	61	7.43	+.44	2.05	13	2	3.1	2	11.5	NW	37	NW	1	7	8	15	6.2	55
WASHINGTON																																
Ellensburg	1727	952.3	1015.5	52	29	40.5	-.2	66	7	17	14	0	24	28	65	.22	-.34	.13	4	0	.3	0	15.5	NW	52	NW	4	8	9	17	7.0	---
Kelso	17	---	---	53	36	44.3	-1.2	69	8	26	1	0	9	---	---	4.09	-.44	.75	19	0	0	0	15.4	---	---	---	---	---	---	---	---	
North Bend CO	194	---	---	50	41	45.7	0	68	8	33	1	0	8	---	---	5.93	+.09	1.13	25	1	.3	0	15.4	---	64	N	16	8	9	16	6.8	---
Olympia	190	1008.8	1016.6	52	34	43.0	-.7	70	23	19	1	0	10	36	78	3.55	-.95	.51	16	0	.1	1	6.1	SSW	25	SSE	18	1	7	23	8.3	---
Seattle CO	14	---	---	52	40	46.1	-.9	65	23	32	1	0	1	---	---	3.22	+.16	.82	14	0	0	0	10.4	---	33	S	16	2	10	19	7.8	33
Seattle																																



## CLIMATOLOGICAL DATA

MARCH 1953

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature										Precipitation						Wind				No. of days (sunrise to sunset)		Possible sunshine																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
												Max. 90° F. or above	Min. 32° F. or below						0.1 inch or more	With thunderstorms	Total	Max. depth on ground			Prevailing direction									Speed	Direction	Date	Clear	Partly cloudy	Cloudy																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	%	In.	In.	In.	In.	In.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h.	M. p. h

Data from airport unless otherwise specified. CO indicates data from city office.

\* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

\* Other data also.

\* Peak gust.

\* Max. 90° F. or above for Alaskan stations.

† Sun below horizon January 1 to 24, inclusive.

(Base 65°F.)

---

\_\_\_\_\_

\_\_\_\_\_

Data from airport unless otherwise specified. CO indicates data from city office.



# SEVERE STORMS

Table 4

MARCH 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Kansas, entire State	1	During day			2	Sev- er- al			Sleet, glaze, and wind	Snow and sleet in north and glaze in south, with strong wind in some localities, as low pressure center moved from southeastern Colorado across Oklahoma. Driving hazardous in most sections and many traffic accidents reported, resulting in 1 death in Hamilton County; numerous injuries, and damages to vehicles. Child died from injuries incurred in fall on ice. Wind at Parsons unroofed 2 hangars.
Chambers- burg, Pa.	2	Daytime				2			Snow	2 persons injured in auto accident on street made slippery by snowfall.
Itawamba County, Miss.	3						\$5,000	\$500	Thunder- squall	Red Cross reported 7 homes damaged and 1 other out- building.
Harrisburg, Pa.	5	Afternoon							Winds	Winds reaching 51 m.p.h. in gusts ripped tin roof from house, downed some signs, and did other minor damage in area.
Pocomoke City, Md.	8	1 a.m.					1,000		Electri- cal	Lightning struck 2 houses within city, damaging roofs of each.
Barber Coun- ty, Kans.	8	8 a.m.		3	0	0	3,500	0	Tornado	Small "tail-like" funnel cloud, reported by 2 wit- nesses, dipped toward ground at least twice, then picked up small building, setting it down a few feet away.
New Jersey, most of State	8	A.m.				5	2,500		Snow	Several traffic accidents due to slippery roads.
Pennsylvan- ia, central portion	8					16			do	2 separate snowfalls about 24 hours apart kept high- ways slippery; at least 16 persons injured, and at least 50 auto crashes, many being multiple car pile-ups.
Clifton, Ariz.	9	8-9 p.m.					10,000		Thunder- storm and flash flood	A heavy thundershower brought 1.35 inches of rain in approximately 30 minutes. Resultant flooding dam- aged some buildings and automobiles, with consider- able debris littering town close to Chase Creek Street.
New Shire- manstown, Pa.	9					2			Snow	2 persons injured when their car skidded on icy highway and crashed into utility pole.
Chambers- burg, Pa.	10	Daytime				3	0		do	3 persons injured in falls on icy walks and steps.
Hilo, Hawaii	10	1:30 p.m.			1		5,000		Rain	Cane worker killed by 7-ton boulder in landslide loosened by heavy rains. Property damaged by water running through homes and gardens.
Austin, Tex.	11	5-6 p.m.					°65,000	°	Hail and wind	Hailstones 1 inch in diameter at Airport. Storm centered in northwestern part of city.
Big Wells, Carrizo Springs, and Crystal City area, Zavalla and Dimmitt Counties, Tex.	11	8 p.m.	1,760	6			5,000	160,000	do	Hailstones generally size of golf balls. Heavy damage to onion crop. Most damage from hail.
Carthage, Panola County, Tex.	12	4:50 p.m.	400	2	0	3	50,000		Tornado and hail	Accompanied by moderate hail, which did no damage. Principal damage to buildings and automobiles.
Little Rock, Ark.	12	6:03 p.m.					8,000		Hail	Stones 1/4 inch in diameter. \$6,000 damage to planes at Municipal Airport. \$2,000 damage to commercial greenhouse.
New Jersey, most of State	12 13						10,000		Rain	2- to 4-inch general rain flooded streets and cel- lars.
Judd, O'Brien, and Knox City, Has- keil and Knox Coun- ties, Tex.	13	2 p.m.	500	18	17	25	600,000		Tornado	33 homes destroyed; 139 homes damaged; 43 other buildings destroyed.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

MARCH 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Elmer and Harmony communities, Jackson County, Okla.	13	2:30-4:30 p.m.	*6 to 8	20			\$1,000	Minor	Wind and hail	Considerable hail, but crops not advanced enough to be severely damaged. In Elmer, many roofs and windows damaged. 1 barn blown down and roof blown off an abandoned school.
Lawton-Ft. Sill areas, Comanche County, Okla.	13	4:30 p.m.	*3 to 4	3 to 4		1	2,000,000		do	All roofs damaged and many windows broken in Lawton. More than 13,000 damage claims, with about \$750,000 damage in City. Many automobiles dented by hail 1 to 2 inches in diameter. Extensive aircraft damage in Fort Sill area, as well as damage to buildings. Damage of \$100,000 due to high wind; and \$1,900,000 due to hail.
Rush Springs to point about 6½ miles southwest of Blanchard, Grady County, Okla.	13	5:15-5:35 p.m. in Rush Springs area	100	25	0	1	50,000	\$ 0	Tornado and hail	Path north-northeastward about 2 miles long in Rush Springs area, then storm apparently lifted coming down again southwest of Blanchard, with over-all length about 25 miles. Funnel observed tearing up fences and trees 6½ miles southwest of Blanchard, but did not hit any buildings there. In Rush Springs area 81 homes damaged. Quonset hut 1 mile south of Rush Springs damaged, although cattle inside were not hurt, first building of this type known to have suffered damage from wind. Tornado cut through southern and eastern sections of Rush Springs. 1 person in Rush Springs picked up and carried 300 feet and slightly injured. No serious injuries. Accompanied by hail in Rush Springs area, marble to golf-ball size. \$5,000 damage by hail and \$45,000 by tornado.
Burneyville (near), Love County, to Tishomingo (north of), Johnston County, Okla.	13	5:30-9 p.m.	75 to 300	50	2	11	20,000	0	Tornado, hail, and rain	Funnel first observed near Burneyville in southern Love County at about 5:30 p.m. where several buildings unroofed. Tornado then apparently rose, coming to earth again 3 miles east of Dickson where 2 persons were killed; crossed southeastern Carter County; then moved northeastward through Johnston County, damaging or destroying 11 more farmsteads. 1 person holding storm cave door from inside, northwest of Mannsville, was thrown out of cave and seriously injured. Storm continued northeastward for another 15 miles toward Wapanucka, with hail and heavy rains. Wapanucka recorded 2½ inches of rain. Some tornado damage observed near Troy and near Ravin. Principal damage east of Dickson and northwest of Mannsville between 8:30 and 9 p.m.
Bradley, Grady County, Okla.	13	6:19-6:29 p.m.	80 to 120	1	1	8	250,000	0	Tornado	Debris from this tornado found south and also northeast of Blanchard, a distance of 25 miles to north-northeast of Bradley. 8 homes, telephone office, and postoffice, destroyed. High school and gymnasium damaged. 15 homes wrecked or damaged. Funnel cloud seen. Tornado passed over in about a minute. Considerable lightning, but no rain until 15 to 20 minutes afterwards.
Washington, McClain County, Okla.	13	6:45-7 p.m.	75 to 100	2	0	2	200,000	0	do	Path north-northeastward to northward. Because of warnings virtually every resident was able to get to basements or cellars.
Norman (10½ miles east and 1½ miles south of), Cleveland County, Okla.	13	7:30 p.m.	250	1-1/4	0	0	1,560	0	do	Trees destroyed. Funnel moved northeastward ½ mile where farmstead badly demolished. Cow carried 100 yards.
Red Oak and vicinity, Latimer County, Okla.	13	9 p.m.	440	1			10,000	0	Wind and rain	Practically all buildings in community suffered damage. In addition to estimated \$10,000 property loss to buildings, there was considerable damage to roads and bridges as a result of washing rains.
Monroe (2 miles west of), LeFlore County, Okla.	13	10-10:30 p.m.	100	Short	0	0	2,240	0	Tornado and rain	A farmstead struck, where barn and 2 chicken houses destroyed and farm home moved 5 feet off foundation. Accompanied by heavy rain. Cow injured. 30 to 35 chickens killed; feathers blown off.
Esterbrook, Wyo.	13	Evening				1			Snow	Man lost during storm and died of exposure.
Logan and Johnson Counties, Ark.	14	12:30 a.m.	880	42	0	0	37,500	0	Tornado and hail	Storm first struck Chismville in Logan County at 12:30 a.m. and skipped over path northeastward to point 5 miles northeast of Clarksville Airport in Johnson County. 5 homes damaged and 1 church destroyed in Chismville area. 4 hangars and 3 airplanes destroyed at Clarksville Airport. Some damage to tile factory near Clarksville. Considerable damage to standing timber.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

MARCH 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Stone and Izard Coun- ties, Ark.	14	12:30-1 a.m.	300	24	0	0	\$61,000	\$ 0	Tornado	Storm first struck near Newnata in Stone County and moved northeastward to Myron in Izard County. Principal damage in Belleview, LaCrosse, Franklin, and Myron area of northeastern Izard County. A total of 22 houses either destroyed or extensively damaged, and 3 barns destroyed.
Van Buren County, Ark.	14	12:30- 2:30 a.m.							Hail and wind	Some damage to a few roofs.
Tulsa, Okla.	14	1-2 a.m.					9,000	0	Electrical	Lightning struck church.
Yell and Pope Coun- ties, Ark.	14	1:30 a.m.	880	22	0	7	145,500	0	Tornado	Storm first struck east of Delaware in Yell County and moved northeastward through Bunker Hill and Mill Creek communities to Dover in Pope County. Bunker Hill-Mill Creek area hardest hit; 18 homes destroyed, 56 damaged and 2 barns and many outbuildings destroyed. 7 persons injured but only 2 serious injuries reported.
Prentiss County, Miss.	14	2:30 p.m.	40	3	1	0	10,000	1,000	do	Occurred at Hills Chapel settlement, 8 miles east of Booneville. 2 homes destroyed, 6 damaged.
Harrisburg, Ark.	14	3:30 p.m.							Hail	Extensive damage to roofs and neon signs.
Scott, Greene, Morgan, and Sangamon Counties, Ill.	14	4 p.m.					250,000		do	Greenhouses, roofs, windows, and cars damaged. Heaviest losses sustained in Manchester and Roodhouse areas. Hailstones over an inch in diameter reported in many localities.
New Haven, Mo.	14	4:30 p.m.					2,000		Hail and wind	High winds were state-wide on March 14. Roofs damaged; windows broken; neon signs broken and blown down.
Audrain County, Mo.	14	Afternoon					1,000		do	Roofs damaged; windows broken.
De Soto, Mo.	14	Afternoon					500		do	Roofs, windows, and signs damaged.
Elsberry, Mo.	14	5 p.m.			0	1	8,000	0	Tornado	Building, under construction, destroyed. Man working on this building injured when it collapsed. Auto wrecked by falling tree and roofs damaged, though probably not caused by tornado.
Lepanto- Rivervale area, Poin- sett County, Ark.	14	5:30 p.m.					1,000		Wind and hail	Tenant house blown from foundation. Hail damage negligible.
Brownsville, Haywood County, Tenn.	14	5:45-6:05 p.m.	35	25	0	8	10,000	0	Tornado and hail	Tornado accompanied by small hail moved northeastward. 2 homes destroyed and 3 damaged. 7 farm buildings destroyed and 14 damaged; 10 families affected.
Henderson (vicinity of), Hen- derson County, Tenn.	14	6 p.m.	100	25	0	2	50,000	0	do	3 homes destroyed and 21 damaged. 17 farm buildings destroyed and 19 damaged. 32 families affected. Storm moved northeastward.
Newbern and Dyersburg, Tenn.	14	6:30 p.m.			0	0	30,000	0	do	Extensive damage to roofs due to hail reported from Newbern Section. 3 miles north of Dyersburg Airport, CAA personnel, off duty, reported hailstones 3-1/4 inches in diameter by actual measurement. Storm moved northeastward.
Jefferson Parish, La.	14	6:30 p.m.	50	*300			2,000		Thunder- squall	Most damage to a garage and an outbuilding at South Kenner. Storm moved southeastward.
Boone Town- ship, Cass County, Ind.	14	7 p.m.	100				13,000		Wind	Barn blown down; stored grain scattered. Local residents believe storm may have been a tornado, but positive identification could not be obtained.
Ripley, Lau- derdale County, Tenn.	14	7 p.m.			0	0	10,000	0	Tornado and hail	1 home destroyed and 8 damaged. 2 farm buildings destroyed. Storm moved northeastward.
Jackson, Madison County, Tenn.	14	7-8 p.m.	100	25	0	3	40,000	0	do	4 homes destroyed and 5 damaged. 12 farm buildings destroyed and 5 damaged. 10 families affected. Storm moved northeastward.
Washington, Jefferson, and Marion Counties, Ill.	14	8:15 p.m.	50- 200	45	0	0	75,000	0	Tornado	Struck first about 6 miles southwest of Nashville, then moved northeastward through rural areas. 1 home destroyed, several damaged, and a large number of other structures hit. Heaviest losses in Washington County.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

MARCH 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Martin-Dresden section, Weakley County, Tenn.	14	9:15 p.m.	600	1/4	0	1	\$10,000	\$ 0	Tornado and hail	5 homes damaged. 6 farm buildings destroyed and 11 damaged. 5 families affected. Storm moved north-eastward.
New Goshen (½ mile east of), Ind.	14	10 p.m.	100	**200	0	0	500	0	do	Storm moved northeastward. Characteristic roar heard, although no funnel-shaped cloud observed. Garage lifted and carried off its foundation. Trees showed twisting effect.
Bridgeton (southeastern part), Ind.	14	P.m.			0	0	1,500	0	Wind (possibly tornado), rain, hail, and electrical	House moved from foundation and part of roof and shutters blown off and carried some distance. Damage about 95 percent by wind.
Wynne, Ark.	14	P.m.							Wind and hail	Storm struck south of Wynne. Principal damage to screen of drive-in theater. Some hail damage to automobiles.
Granville (near), Ohio	15	Early a.m.							Electrical	Barn, livestock, and stored crops destroyed completely by fire.
Fort Meade, Md.	15	7:30 p.m.				4	1,000		do	Bolt of lightning struck home, damaging 2 rooms. Family of 4 treated for shock.
Hopewell, Va.	15	9:20 p.m.					50,000		Thunderstorm	Roof of radio station partially torn away. Rafters of partially constructed church buckled and basement roof cracked open. Nearly 100 homes damaged in varying degrees. Minor power failures occurred. Trees uprooted.
Edgecombe, Nash and Wilson Counties, N. C.	15	9:30 p.m.	25	30	0	1	100,000	0	Tornado	Forming in connection with a cold front which trailed from low pressure crossing Great Lakes area, storm described as a "small, skipping tornado" moved along broken path; first noted at Bailey, in Nash County, moving directly across Wilson, in Wilson County, and continuing eastward into Edgecombe County. Greatest reported local damage was in eastern part of Wilson where damage to school estimated at \$30,000, necessitating closing; a number of homes severely damaged. Total damage in Wilson estimated at \$70,000. Red Cross reports as follows: Wilson County, 1 person injured, 16 homes damaged, 16 families affected. Nash County, 5 homes and 10 other buildings damaged, 7 families affected. Edgecombe County, 1 home and 1 other building destroyed, 3 homes damaged, 4 families affected. Said to have been most destructive storm to hit city of Wilson since 1929.
Wisconsin, central portion	15								Ice (glaze)	Freezing rain disrupted 63 long distance telephone circuits in north-central Wisconsin from Stevens Point to Medford, Marshfield and Eau Claire.
DeWitt, Ark.	17	10 p.m.							Wind	Power lines, television antennae, and outhouses damaged.
Noble Lake Community, Jefferson County, Ark.	17	10:45 p.m.				1	6,000		do	4 houses and several outbuildings damaged.
Nohly, Mont.	17-18	11 p.m., 17th-8 a.m., 18th					1,000		do	Damaged farm buildings.
Mobile, Ala.	18	2:22 p.m.	125	**75	0	2	15,000		Tornado and hail	Storm moved northeastward. Hail, with stones from ½ to ¾ inch in diameter. Tornado apparently just touched ground in one small area. 2 residences destroyed and 7 damaged.
Fort Wayne, Ind.	18	6:35 p.m.	35	3½	0	0	12,000	0	do	TV antennae twisted; power lines downed; 8 to 10 trees blown down. Storm struck south edge of Fort Wayne, then skipped about 3½ miles east-northeastward to demolish 1 house and unroof another. Funnel-shaped cloud observed.
Chesterfield, Ind.	18	6:40 p.m.					9,000	0	Wind, thunderstorm, and rain	About 35 percent wind damage; 65 percent water or rain damage. Portion of roof of market and adjacent hardware store blown off and merchandise damaged by rain.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

MARCH 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Decatur (3½ miles southeast of), Ind.	18	7 p.m.	25	4	0	0	\$6,640	\$ 0	Tornado and rain	Storm moved southeastward. Barn destroyed; 6 cows killed; buildings on adjacent farms unroofed. Tim- ber scattered with and at right angles to path. Trees twisted off. Damage 100 percent by tornado.
Edon (near), Ohio	18	Early evening	16	1/8			200		Wind	Strong winds associated with squall line preceding cold front.
Viffin, Ohio	18	9:30 p.m.							do	Same squall line demolished 33 X 72 foot garage and damaged portion of nearby house.
Ruidoso, N. Mex.	20	10 a.m.					2,500		do	Building under construction blown down.
Ft. Pierce, Fla.	21	9 a.m.— 10 p.m.			0	0		Minor	Tornadoes, hail, and rain	Total precipitation for this period was 6.58 inches. Hailstones of marble size fell around 11 a.m. Tor- nado cloud, that did not quite reach ground, ob- served moving eastward about 10:20 a.m. Cloud per- sisted for about 10 minutes. About 11:00 a.m., another tornado cloud observed moving westward. Cooperative observer at city water plant reported that, during very heavy rain accompanied by hail the size of marbles, there was a rumbling sound over- head as that of a train at 11:05 a.m. Waterspout observed over river about 11:30 a.m., dissipated without reaching land. Highest surface winds noted at water plant were 42 m.p.h. Airplane overturned at Ft. Pierce Airport; this the only property dam- age of importance.
Kansas City, Mo.	21	Day				10	30,000		Wind	30-foot section of brick wall blown down. 8 automo- biles damaged when struck by section of 60-foot lumber shed which was blown down. Numerous plate- glass windows broken. Damage to roofs, trees, chimneys, windows, signs, and television antennae. Injuries caused by pedestrians being blown off their feet or into objects.
Butler, Mo.	21	Day					2,000		do	Screen of drive-in theater wrecked; other light damage to windows, roofs, etc.
Warrensburg, Mo.	21	Day					5,000		do	Light airplane wrecked; roofs and windows damaged.
St. Joseph, Mo.	21	Day				2	10,000		do	2 persons injured when blown off their feet. Damage to roofs, windows, signs, etc.
Plattsburg, Mo.	21	Day					5,000		do	Barn and outbuilding unroofed; other widespread light damage.
Lee's Sum- mit, Mo.	21	Day					5,000		do	Roof blown off building under construction. Barn unroofed; extensive damage to another.
Concordia, Mo.	21	Day					3,000		do	Granary, machine shed, and new poultry house wrecked.
Kansas, eastern half of State	21	During day				Sev- er- al			do	In warm sector of an extremely low pressure system, winds of 25 to 55 m.p.h. with gusts up to 72 m.p.h., began in west on afternoon of 20th and became most severe in eastern half of State during middle of 21st. Blowing dust reduced visibility to zero in some localities and driving was difficult, especial- ly on east-west roads, some of which were closed. Injuries occurred to several persons blown down. Some wheat lost and hundreds of instances of light damage to TV antennae, roofs, barns, etc.
Danbury (3 miles east of), Iowa	21	12:45 p.m.			0	2			0 Tornado and hail	Roof of machine shed collapsed upon occupants. Barn and machine shed completely destroyed and other buildings damaged on 1 farm. Hail at nearby Maple- ton, size of shelled walnuts.
Ute, Iowa	21	1 p.m.	600		0	0	6,500		0 do	Elevator destroyed; other buildings unroofed; glass windows broken. Light hail size of peas.
Lenox (3 miles south- east of), Iowa	21	3 p.m.					5,000		Wind and hail	Barn unroofed; machine shed and garage damaged. Truck lifted off ground. Light hail.
Jack Creek Township, Emmet Coun- ty, Iowa	21	3 p.m.	400	7	0	0	150,000		Tornado and wind	Machine shed destroyed and major damage to other buildings on 1 farm. On next farm, barn, chicken house, and machine shed destroyed; 2 cows and 100 chickens killed. Storm skirted northwestern sec- tion of Ringsted, demolishing barn and causing major damage to other buildings. Damage estimate includes wind damage at Maple Hill and other points in Emmet County.

See footnotes at end of table.

# SEVERE STORMS

Table 4-Continued

MARCH 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Minnesota, central and southern counties	21	3-4:43 p.m.	100	11	2	3	\$450,000	\$ 0	Tornado, winds, rain, hail, and electri- cal	Funnel cloud dipped to earth in North St. Cloud about 4:43 p.m. where a launderette, storage warehouse, lumber yard, and several garages demolished and several store fronts blown out. Boy killed when launderette wrecked. Elsewhere in southern and central counties, possible tornadic winds caused extensive property damage from Fairmont near Iowa border northward and northeastward to vicinities of Sedan and St. Cloud. Storm especially severe near Gibbon, Nicollet County, where all buildings on a farm reported wrecked; farmer in that locality killed and 3 other persons injured. Heavy rains, light to heavy hail, and damaging lightning accompanied storm. Considerable minor property damage, mainly from wind, occurred outside of narrow path of great destruction in southern and central counties.
Cedar Falls, Iowa	21	4:30 p.m.	3,500				250,000		Hail and wind	Very severe hailstorm damaged nearly every house in city of 14,000. Hailstones size of golf balls reported driven by strong winds.
Tama County, Iowa	21	5 p.m.	100	10	0	0		0	Tornado	Storm moved north-northeastward from point 6 miles south-southwest of Tama, across east part of Tama, and east of Toledo. Several large barns and numerous smaller buildings destroyed. Extensive damage to homes in Tama, including 1 small home turned upside down, but not demolished.
Richmond, Mo.	21	Afternoon					3,000		Wind	High southwest winds throughout State on March 21, reaching 60 to 70 m.p.h. in gusts. Machine shed destroyed; 2 barns unroofed; plate-glass windows blown out; widespread roof damage.
Eldon, Mo.	21	Afternoon			0	0	0	0	Tornado (prob- able)	Poultry range shelter, a structure about 8 X 10 feet, weighing about 1,000 pounds lifted as high as a 2-story house and set down unharmed near original position. No funnel seen.
Versailles, Mo.	21	Afternoon					2,000		Hail	Damage to roofs, windows, fruit trees, etc.
Eau Claire, Wis.	21	6:50 p.m.	300	8		3	200,000		Wind	Severe winds caused property damage from Town of Brunswick to southwestern part of City of Eau Claire. Storm moved north-northeastward. 3 barns and several other buildings blown down in rural area. 1 ski slide toppled. Several head of live-stock killed. In Eau Claire trees uprooted, houses damaged, and telephone lines broken.
Pulaski, White, In- dependence, Prairie, Woodruff, Jackson, Cross, Poinsett, Craighead, and Cleve- land Coun- ties, Ark.	22	12:10- 2:30 p.m.				1	435,500	0	Wind, hail, rain, and electri- cal	Widespread wind, hail, rain, and electrical storms buffeted eastern Arkansas. Many houses extensively damaged and a few totally destroyed. Heaviest damage in Beebe and Searcy areas of White County. Total damage in White County estimated at \$141,000; in Craighead County \$200,000, principally near Monette in northeast corner; in Poinsett County \$51,500, principally in Lepanto-Rivervale area; in Pulaski County \$12,000, principally near Jacksonville; in Independence County 1 person injured by lightning, and property damage estimated at \$20,000; damage in Woodruff County \$5,000; in Cross County \$1,000, principally near Wynne; in Cleveland County \$5,500.
Dresden, Weakley County,Tenn.	22	3 p.m.							Wind and hail	Widespread damage to roofs and television aerials. Much damage throughout county. Storm moved north-eastward.
Newbern and Dyersburg, Tenn.	22	3:15 p.m.	100	30	0	0	150,000	0	Tornado and hail	This storm, traveling northeastward, accompanied an instability line that moved into West Tennessee during afternoon. Damage to many homes and buildings resulted, but due to timely warnings by Memphis Weather Bureau and co-operation of radio stations no lives reported lost and no one injured.
Simpson, Smith, Jas- per, New- ton, and Lauderdale Counties, Miss.	22	Afternoon		180	0	1	915,000	8,000	Tornado	Several homes destroyed and others damaged.
Adams, Car- roll, War- ren, Marion, Alcorn, Kemper, and Lowndes Counties, Miss	22	Afternoon					40,000	2,500	Thunder- squalls	Hail reported, but most damage caused by winds. Greatest damage in northern Marion County and Alcorn County about 6 miles northwest of Corinth.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

MARCH 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Vernon, Natchi- toches, Grant, Winn, Caldwell, Richland, and Carroll Parishes, La.	22	Afternoon	100	260	2	22	\$750,000	\$10,000	Tornado	Developed around Camp Polk and Leesville in Vernon Parish, and moved northeastward into Washington, Miss. Most damage at Columbia, La. Report indicates severe line squall at some points along path. Winnfield, La., observer reported rise in barometer from 29.60 to 29.70 inches almost instantly as storm struck. Tornado apparently of skip-jump type.
Washington County, Miss.	22	Afternoon	100	260	0	0	5,000		0 do	Crossed from Louisiana. Skip-jump type degenerated into area of heavy squalls. Length of path 260 miles in both States.
Florence (6 miles west of) and Sky Harbor Airport (10 miles northeast of Flor- ence), Lau- derdale County, Ala.	22	6:45 p.m.	* 1½	1	0	0	23,000		Tornado and hail	Apparently same storm, with tornado occurring only at Sky Harbor Airport. Debris 6 miles west of Florence was all blown in same direction by winds from westerly direction. At Sky Harbor Airport storm moved northeastward. Hail size of marbles accompanied storm. Church blown down and several buildings damaged west of Florence. At Airport a concrete-block wall of hangar destroyed and part of roof blown away; 2 light aircraft and other equipment damaged beyond repair.
Reform and Friendship Community (north of Reform), Pickens County, Ala.	22	7 p.m.					20,000		Thunder- storm	At Reform 1 residence destroyed, 5 damaged; 3 other buildings destroyed and 6 damaged. In Friendship Community, 1 house and a vacant school house blown down; other damage reported.
Eldridge Community (18 miles west-north- west of Jasper), Walker County, Ala.	22	7:30 p.m.				8	20,000		do	Winds from west or southwest. Some hail accompanied storm. 2 houses destroyed and 12 damaged; 1 other building destroyed and 5 damaged. Of the injured, 3 considered critical.
Charleston area, Coles County, Ill.	22	7:30 p.m.					10,000		Winds	Winds estimated at 60 m.p.h. damaged a drive-in theater, farm buildings, and television antennae.
Bessemer (southwest of), and Durham Air- port, Jef- ferson County, Ala.	22	8:30 p.m.	1,760	1½			30,000		Thunder- storm	Winds from south, with gusts estimated near 100 m.p.h. Path of greatest damage southwest of Bessemer, although minor damage over area extending 10 to 12 miles to southwest. 2 buildings unroofed, wooden fences blown down, and numerous trees uprooted. At Durham Airport a small hangar blown down, 2 others damaged, and 12 light aircraft destroyed.
Campbell County, Wyo.	23	9 a.m.— 6 p.m.					Light		Wind	Roof blown off a few sheds.
Maryland and Delaware, entire region	25-26	P.m. and a.m.							Rain and wind	Winds buffeted entire area most of night, knocking down trees and limbs. Part of Highway 1 at Peace Cross inundated. Telephone lines out in Buckeyes-town, Laurel, and Bel Air sections. 3 barges ripped from moorings in Harbor at Baltimore. Yacht with 2 aboard almost sunk in Potomac River.
Bokchita (near), Bryan Coun- ty, Okla.	26	9 p.m.			0	0	0		0 Tornado	Funnel observed, above ground.
Lawton Muni- cipal Air- port (at and near), Comanche County, Okla.	29	7:25-8:10 p.m.	100	1	0	0	600		0 do	Believed to be small tornado which damaged farm buildings and carried a 6-foot square steel box over 2 fences and set down about 100 yards away. Damaged fences, and thermometer shelter at airport.
Carnegie (12 miles south and 5½ miles east of) also Carnegie (4 miles north and 1 mile east of), Caddo Coun- ty, Okla.	29	11 p.m.					2,200		0 Wind	Buildings on 3 farms damaged. Farms not near each other.

See footnotes at end of table.

# SEVERE STORMS

Table 4—Continued

MARCH 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Robert Lee, Coke County, Tex.	29	11:45 p.m.					\$2,500		Wind	Blew top off warehouse.
Harper County to Coffee County, Kans.	30	Afternoon and early evening			0	0	107,000	\$ 0	Tornado, hail, electrical, and rain	First evidence of violent activity along squall line was a tornado sighted near Harper-Sumner County line south of Argonia; observed to move northward along 15-mile path from 2:30 to 3:20 p.m. From 3:15 to 8:30 p.m., series of thunderstorms, accompanied by hail occurred from Harper County north-eastward. Wichita experienced 4 distinct storms, with damaging hail from each in some section of city. Other heavy hail fell in 2 x 8 mile strip in Sumner County west of Wellington about 6 p.m. and at Harper in Harper County during evening. North and east of Wichita severe thunderstorms with heavy rain occurred, but with little damaging hail. Lightning strikes set fire to 2 barns, 1 in Wichita and 1 in Marion County, and killed 2 head of cattle near Marion. Property loss by hail, \$100,000; by lightning, \$7,000.
New Jersey, most of State	30	Early p.m.					5,000		Wind	Strong winds throughout State caused some damage to trees, communications and power lines, and roofs.
Giddings, Lee County, Tex.	31	7:15 a.m.	1,760	5			5,000		do	Damage to garages and barns.
Coffey, Anderson, Linn, Franklin, and Miami Counties, Kans.	31	7:50-8:20 a.m.					52,000		Hail and electrical	Thunderstorms in east-central Kansas brought hail to a number of localities, but damage reported only at Osawatimie, in Miami County, where stones as large as golf balls battered roofs and automobiles. Near Burlington a barn burned and calf killed from lightning strike. Property loss by hail, \$50,000; by lightning, \$2,000.
Eldorado Springs, Mo.	31	8:30 a.m.					100,000		Hail	Nearly every roof in town received extensive damage. Breakage of windows facing south very heavy. Automobile bodies dented, and windshields broken. Area of damage seemed to be confined to town proper. Little rain fell either during or after storm, so little damage from water entering damaged roofs or broken windows.
Cherry Hill Community, Perry County, Ark.	31	10-10:15 a.m.				5	5,000		Wind	Wind struck Cherry Hill Community, completely demolishing school and church building; 5 persons injured, 2 seriously.
Pulaski and Lonoke Counties, Ark.	31	12:55-1:25 p.m.					64,000	3,000	Hail and wind	Principal damage in Lonoke County in vicinity of town of Lonoke where hailstones weighing from $\frac{1}{2}$ to $\frac{3}{4}$ pounds and up to 12 inches in circumference reported. Heaviest hail in Pulaski County in vicinity of Scott. Crop damage to gardens and truck crops.
Coshoma County, Miss.	31	2 p.m.			0	0	50,000	5,000	Tornado	2 homes damaged, 2 barns destroyed, and several other outbuildings damaged. Funnel cloud seen at Farrell and Stovall.
Adrain, Mo.	31	4 p.m.			0	0	3,500	0	do	Barn and poultry house destroyed, killing cow and number of hens, on farm 4 miles southeast of Adrain.
Uriah, Mo.	31	4:30 p.m.			0	0	6,000	0	do	Barn destroyed; numerous farm outbuildings destroyed or damaged; residence damaged.
Norris, Mo.	31	5 p.m.			0	0	0	0	do	Funnel cloud reported by several persons in Norris, but no damage reported.
Scottsville, Ky.	31	7-9 p.m.			1		12,000		Electrical and rain	Lightning struck a sawmill during heavy rain and electrical storm, resulting in fire which destroyed mill and caused the fatality.

## DEIAYED REPORT:

Near New Cumberland, (Reeser's Summit Hill), Pa.	Feb. 27	11-11:30 a.m.					Several hundred		Winds	Strong, gusty winds tore off porch roof and carried it about 60 feet. Some metal awnings on nearby home blown away.
--	---------	---------------	--	--	--	--	-----------------	--	-------	---

- \* Miles instead of yards.
- \*\* Yards instead of miles.
- ° Crop damage included with other property damage.



# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

MARCH 1953

The most important floods during the month occurred in the New England States. The damages in Maine alone were estimated at around 10 million dollars. The floods in the Merrimack River Basin in Massachusetts and New Hampshire were severe and caused considerable damage. In the Pemigewasset River at Plymouth, N. H., the stage was the highest since September 1938.

ATLANTIC SLOPE DRAINAGE.—The heavy rains between the 24th and 28th caused heavy flooding on the major rivers and tributaries in Maine between the 26th and April 4. All rivers in the state were at below normal levels before the beginning of these rains. The Swift River, a tributary of the Androscoggin and the Sandy River at Farmington, began overflowing on the 26th. Fifteen hundred people were forced to evacuate their homes in the town of Mexico along the Swift River. Mexico was still marooned on the 28th, and several places in Rumford and Farmington were isolated. A teamster and his horses were drowned near Fairfield when a wooden bridge collapsed over Martin, a tributary of the Kennebec. In the Little Canada section of Lewiston several families were forced to leave their homes. Other towns isolated were Bethel, Canton, Andover, Roxbury, Milton, East Dixfield, Byron and Carthage. The Saco River rose more slowly than the other major rivers and was still rising on the 29th. Several families had to be evacuated in the neighborhood of Irving Street in Saco and portions of U. S. Highway 1 were under water. The Saco began to recede on the 30th. The Androscoggin and Kennebec crested on the 28th and started to recede in the afternoon. Some factories were flooded at Brunswick, near the mouth of the Androscoggin. The Androscoggin and Kennebec Rivers started to rise again on the 30th and were still rising on the 31st. They, however, did not approach their former levels. Evacuees were beginning to move back into their homes on April 2 in southern and central Maine. The Aroostook and St. John's Rivers, however, were causing trouble at Presque Isle, Fort Fairfield and Van Buren. A bridge was destroyed at Fort Fairfield on April 3, due to an ice jam. The flood threat was over by April 4. Preliminary damage estimates were around 10 million dollars.

There were two periods of high water in the Merrimack River Basin in Massachusetts and New Hampshire during March. The first period of high water occurred between the 15th and 20th and was confined to the lower half of the basin. Rainfall during this period averaged from 3 to 4 inches in the lower sections and 1.5 to 2 inches in the upper portion. Flood stages were reached only in the section below Garvins Falls, N. H. Damages from this rise were limited to flooded basements in a few factory buildings in Lowell and Lawrence, Mass. A much more serious flood began on the 26th, which extended into early April. Flood stages occurred throughout all reaches of the main river and most of the tributaries. Severe flooding with heavy property damage occurred in the area above Bristol, N. H. The greatest rainfall fell over that section and combined with heavy snow-melt, to cause the highest stages since the flood of September 1938. Headwater area rainfall during the flood period averaged 4.5 to 5 inches. While overflows were widespread and extended into all parts of the drainage area, damage was small in all except

the area of the Pemigewasset and its tributaries. The real heavy damage in that area was concentrated within a relatively small section over a radius of 20 miles of Plymouth, N. H. In the lower Merrimack River losses were almost exclusively due to factory shutdowns causing loss of production and wages; and this occurred at only a small percentage of the total number of factories in the area. Considerable spotty damage occurred to summer dwellings located around the lakes.

The Hudson and Mohawk Rivers and tributaries rose to near flood stage on the 28th due to heavy rainfall (2 to 4 inches) over a four day period and melting snow in the Adirondacks. A serious flood threat was averted as the crests did not arrive simultaneously in the Troy-Schenectady-Albany, New York area.

The light flooding in the Chenango, Susquehanna and Chemung Basins was due to moderate to heavy precipitation that occurred on the 24th and 25th. No damage resulted from the slight overflows.

Minor flooding occurred in the lower Potomac near Washington, D. C. at the Leiter gage between the 26th and 28th due to heavy rain on the 23d-24th. No damage resulted from the light overflow. One life was lost indirectly as a result of the high water in Rock Creek in the Washington, D. C. area.

Moderate rises to above flood stages occurred on the 23d-27th in the Jackson River at Covington, Va. and in the James River at and below Scottsville, Va. Rainfall averaged more than 2 inches in the James River Basin above Richmond, Va. Rainfall was considerably heavier in the upper Mechum, Hardware and Rockfish Rivers averaging 5.5 inches. Precipitation was lighter over the southern tributaries, one to two inches. Some highways in the basins above Columbia were covered slightly and harbor traffic in Richmond was suspended for about 48 hours.

The flooding in the streams in eastern North Carolina was due to rainfall which occurred during the 1st-4th, 11-15th and 23d-24th. There was some flooding on all rivers during the month except on the Tar River. The prolonged high water resulted in delays in river traffic on the Cape Fear River and interfered with logging operations on the lower Roanoke.

By the end of February heavy rains had brought the Edisto River out of its banks from its source to Givhans Ferry, S. C. and below. The Black River was steadily approaching flood stage; the Lynches River was high. The Waccamaw at Conway was at the highest stage since March 1952; the Great Pee Dee had reached a crest almost 5 feet above flood stage at Pee Dee, S. C. and was beginning to fall as the crest moved down stream. Heavy rains during the first week of March caused the Edisto at Orangeburg to rise above flood stage again on the 5th. The lower stream reached a stage of 12.5 feet at Givhans Ferry, on the 7th, the highest stage since September 1949, and remained in flood for 18 consecutive days. The Pee Dee River rose to nearly 6 feet above flood stage at Cheraw, S. C., on the 26th. Below Cheraw the Pee Dee remained in flood for 26 days. No damage was reported but lumbering operations in the swamps of the lower Pee Dee had been suspended indefinitely since early January.

The light flooding on the Broad River at Blairs, S. C. on the 24th and 25th was due to moderate to heavy rains which was especially heavy over



# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS—Continued

MARCH 1953

the Enoree and Tigre Rivers, tributaries of the Broad. Flooding on the Catawba River at Catawba, S. C. on the 25th was due to the heavy discharge from the Catawba Dam on the morning of the 24th. No damage was reported.

Moderate rains during the first and middle part of the month kept the Ogeechee River at Dover, Ga. above flood stage through the 19th. No damage resulted.

**EAST GULF OF MEXICO DRAINAGE.**—The Apalachicola River at Blountstown, Fla. continued above flood stage from the first of the month until the 18th and the Alabama River at Millers Ferry and Claiborne, Ala. until the 4th and 6th respectively due to the heavy rains during the last week of February.

Streams in the Pascagoula and Pearl River Basins were cresting early in the month from the precipitation in February and were generally receding until the heavy rains on the 11-13th caused another rise to nearly the same level as earlier in the month. No damages were reported.

**Upper Mississippi Basin.**—Flooding in the upper Mississippi Basin was minor during March. The spring thaw was attended by conditions retarding rapid run-off. Although there was considerable potential snow moisture, temperatures did not rise to a point to cause rapid melting of the snow mantle. The absorption or initial loss into the soil was remarkably heavy due to little frost depth and the dry condition of the soil in the lower layers from the very dry months of September and October 1952. However, the low absorption loss in the upper Black River from rocky terrain filled the Hatfield reservoir rapidly resulting in considerable spilling and bringing down a wave of water that brought the Black River at Galesville, Wisc. to slightly over flood stage. As this river flood plain is mostly waste land, there was little or no damage. Similar conditions brought the Trempealeau River to flood stage at the mouth near Dodge, Wisc. with practically no damage except erosion loss. The main stem of the Mississippi between St. Paul, Minn. and Dam No. 10 had no serious flooding and no material damage. The rapid rise in the Black brought the stage up to 10.2 feet on the Mississippi at La Crosse, Wisc., 1.8 feet below flood stage. Minor damages occurred on the Wisconsin River at Wausau, Wisc. due to ice jams.

The high water on the Des Moines River on the 31st and the 1st was due to heavy rain (1.3 inches) during the 24-hour period ending at 8 a.m. on the 30th. Most streams in the lower portion were rising due to these rains; runoff from snow-melt was also a contributing factor.

The flooding on the Meramec River at Pacific, Mo. on the 5th and 6th was due to heavy rain (1.25) during the 24-hour period ending on the morning of the 4th. Recurring rains in the Illinois Basin in the 96 hours ending on the morning of the 15th resulted in minor flooding on the Illinois River at La Salle, Ill.

**Missouri Basin.**—The spring ice-breakup along the main stem of the Missouri came 2 to 3 weeks earlier than usual. By the close of March the breakup was complete, except for a few miles above and below Bismarck, N. Dak. Only minor flooding from ice jams in the tributaries accompanied the breakup. Ice jams caused local flooding along the White and Bad Rivers. The Floyd and Big Sioux Rivers ran nearly bankfull,

while there was minor overflowing on the North Fork on the Elkhorn River.

The winter snowfall of 1952 and 1953 was generally below normal in the northern half of the Great Plains. While there were frequent snows in February, temperatures averaged above normal most of the month, and frequent thawing days tended to keep the snow cover reduced about as fast as the new snow came. By the first of March, the heaviest snow cover in the basin between Sioux City, Iowa and Bismarck, N. Dak. lay over the Black Hills section of South Dakota and southward into the northwest quarter of Nebraska, where the average depth ranged from 10 to 14 inches. Elsewhere in this area, there were only 2 to 4 inches of snow cover from the vicinities of Bismarck and Jamestown down across the eastern half of South Dakota, except 5 to 10 inches north of Sioux Falls and near the South Dakota-Minnesota state line.

A temperature regime, favorable to day by day thawing, continued through most of March. The drought during the autumn of 1952 had left the top-soil dry. Soil frost was granular and shallow, so that much of the snow-melt was absorbed into the soil. The winter snow cover alone, posed little threat of floods. On March 14th, central South Dakota received from 1 to 1.29 inches of precipitation, a mixture of rain and snow. Favorable weather following this storm, reduced the snowfield with a minimum of runoff. Ice-breakup on tributary streams posed the main threat of flooding in March. On the Missouri River stages were low and ice was much thinner than usual, ranging from 12 to 15 inches at Sioux City to 20 to 25 inches near Bismarck.

**Ohio Basin.**—Minor flooding occurred on the Wabash and White Rivers in Indiana between the 4th and 16th due to the heavy rain (2 to 3 inches) from the 1st to the 4th. Additional light to moderate rains (1.5 inches) around the middle of the month delayed the crests in the lower Wabash until the 23d or 24th. Little or no damage resulted.

The flooding on the Salt and Green Rivers in Kentucky, and the lower Ohio River was due to heavy rainfall (3-4 inches) between the first and 4th. Flooding was confined to lowlands along the Salt River channel with no damage reported due to the season of the year. Minor flooding also occurred on the Tennessee River at Gilbertsville and on the Chickamauga Creek at Chickamauga, Tenn.

**White, Arkansas and Red Basins.**—The minor flooding in streams in the White, Arkansas and Red Basins during March was due to heavy showers on the 13th and 14th followed by additional heavy showers on the 17th and 18th. The precipitation during the 1st period averaged about 2 inches over the Arkansas, Illinois, upper White and Little Red River Basins; 3.5 inches over the Poteau and about 1 inch on the Black and Middle White River Basins. The precipitation on the 17th and 18th averaged from 2.5 to 3 inches. Sharp rises resulted from these rains with light overflows on the White, Ouachita, Saline, Petit Jean, Little Red, Lower Black and Poteau Rivers. No damage was reported.

The Sulphur River overflowed on two different occasions during the month; the first, from the 15th to the 17th and the second, from the 22d to the 26th. The first overflow was due to heavy rain (1.2 inches) on the 9th and 10th and the second from locally heavy rains over the Red Basin



## GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS—Continued

MARCH 1953

below Denison Dam to Arkansas. No damage resulted.

Lower Mississippi Basin.—The light flooding on the St. Francis River was due to moderate to heavy rains from the 2d to the 4th with additional light to moderate rains on the 14th-15th. Negligible damage resulted from this overflow.

The Tallahatchie and Yazoo Rivers in Mississippi were in minor flood at the close of the month.

WEST GULF OF MEXICO.—Light to moderate flooding occurred on the Sabine River between the 13th and 30th due to light to moderate rainfall during the 2d and 4th weeks. One man and several cattle were drowned near Milam, Texas due to this flood.

Rains averaging 1.8 inches in the Trinity Basin between Dallas and Long Lake, Tex. between the 9th and 12th caused light flooding at Liberty, Tex. from the 17th to the 23d. The flooding in the upper Neches Basin at Evadale, Tex. was due to rainfall averaging 4.4 inches. Little damage

occurred to movable equipment, but there may have been considerable loss of income and wages due to suspension of activities in the South Liberty Oil Field.

Columbia Basin.—Warm weather on the 24th and 25th and again on the 27th and 28th, over the Columbia Basin followed by rather light widespread precipitation caused a slight freshet in the middle and lower reaches of most streams. A few small isolated streams originating above the snow line in the Blue Mountains of eastern Oregon rose quite rapidly to bankfull stage with slight flooding in the very low places. One such stream was McKay Creek about 20 miles southeast of Pendleton, Oreg., a small stream flowing into McKay storage reservoir. The freshet here was of very short duration as were the slight to moderate rises in the streams of northwest Oregon and southwest Washington, west of the Cascades.

# FLOOD STAGE DATA

(All dates in March unless otherwise specified)

MARCH 1955

Table 5

River and station	Flood stage	Above flood stages -dates		Crest*	
		From-	To-	Stage	Date
<b>ST. LAWRENCE DRAINAGE</b>	<b>ft.</b>			<b>ft.</b>	
<u>Lake Erie</u>					
St. Marys: Decatur, Indiana	13	4	7	16.1	4
Maumee: Fort Wayne, Indiana	15	4	4	15.4	4
<b>ATLANTIC SLOPE DRAINAGE</b>					
Androscoggin: Rumford, Maine	603	26	29	607.5	27
Saco: Saco, Maine	54	27	Apr. 2	56.6	29
Baker: West Rumney, N. H.	7	26	27	12.8	27
Pemigewasset:					
Woodstock, N. H.	9	26	27	12.0	27
Plymouth, N. H.	11	26	28	21.2	27
Nashua: East Pepperell, Mass.	8	17	18	8.5	18
Merrimack:					
Concord, N. H.	13	26	29	13.7	28
Garwins Falls, N. H.	5.5	26	29	6.2	28
Manchester, N. H.	7	16	17	7.4	17
		26	Apr. 1	8.6	28
Lowell, Mass.	54	16	17	54.4	17
		26	Apr. 1	55.6	28
Lawrence, Mass.	20	17	17	20.4	17
		27	Apr. 1	21.3	28
Hudson: Troy, N. Y.	15	28	28	15.0	28
Chenango: Whitney Point, N. Y.	12	25	29	13.0	27
Chemung:					
Elmira, N. Y.	12	25	25	14.1	25
Chemung, N. Y.	12	24	25	16.1	25
Susquehanna: Oneonta, N. Y.	12	26	29	13.6	27
Potomac: Washington (nr), D. C.	10	26	28	11.4	26
				11.1	27
Jackson: Covington, Va.	7	24	24	9.3°	24
James:					
Scottsville, Va.	20	26	26	20.0	26
Bremo Bluff, Va.	19	25	26	24.8	26
Columbia, Va.	19	25	27	26.3	26
State Farm, Va.	12	25	27	17.2	26
Richmond, Va.	8	26	27	12.0	27
Rossmore:					
Altavista, Va.	18	23	25	21.1	24
Randolph, Va.	21	24	26	23.6	26
Weldon, N. C.	31	26	28	31.0°	27
Scotland Neck, N. C.	28	29	30	28.1°	30
Williamston, N. C.	10	27	**	11.2	Apr. 5
Neuse:					
Neuse, N. C.	14	16	17	14.2°	17
		24	29	18.0°	27
Smithfield, N. C.	13	13	19	16.8°	17
		25	30	17.3°	29
Goldsboro, N. C.	14	Feb. 18	1	17.5°	Feb. 23
		16	23	16.7°	29
		31	Apr. 3	14.6°	Apr. 2
Kinston, N. C.	14	Feb. 23	2	15.4°	Feb. 26
		21	26	14.7°	24
Cape Fear:					
Mouche, N. C.	20	23	24	20.9	24
Lock No. 2, Elizabethtown, N. C.	20	5	7	20.4°	6
		12	20	25.4	15
				26.5	16
		24	29	27.2°	27
Fee Dee:					
Cheraw, S. C.	30	25	27	35.8	26
Fee Dee, S. C.	19	Feb. 18	11	23.6°	Feb. 23
		14	23	21.3°	19
		26	Apr. 4	22.7°	31
Broad: Blairs, S. C.	14	24	25	18.6	24
Catawba: Catawba, N. C.	8	25	25	10.3	25
Edisto: Givens Ferry, S. C.	10	1	18	12.5°	7
Ogeechee: Dover, Ga.	7	Feb. 26	10	7.9	9
Ocmulgee: Abbeville, Ga.	11	2	7	12.4	6
Oconee: Mount Vernon, Ga.	16	6	7	16.3	7
Altamaha: Charlotte, Ga.	12	1	31	17.0	8
<b>EAST GULF OF MEXICO DRAINAGE</b>	<b>ft.</b>			<b>ft.</b>	
Apalachicola: Blountstown, Fla.	15	Feb. 23	18	19.6	
<b>Alabama:</b>					
Millers Ferry, Ala.	40	Feb. 25	4	15.6	Feb. 24
Claiborne, Ala.	40	Feb. 26	6	12.8	Feb. 24
Pearl:					
Edinburg, Miss.	20	Feb. 23	2	23.0	Feb. 25
Jackson, Miss.	18	Feb. 15	31	29.5	3
Monticello, Miss.	15	Feb. 21	24	20.0	1
				19.8	15
Columbia, Miss.	17	Feb. 25	6	19.5	1
		14	20	19.5	16
Bogalusa, La.	15	Feb. 14	**	19.3	4
				19.3	16
Pearl River, La.	12	Feb. 18	**	15.4	2-3
				15.3	20
<b>MISSISSIPPI SYSTEM</b>					
<u>Upper Mississippi Basin</u>					
Black: Galesville, Wisc.	12	24	25	12.7	25
Trempealeau: Dodge, Wisc.	7	19	19	7.5	19
Illinois: La Salle, Ill.	20	16	16	20.3	16
Sangamon: Raverdon, Ill.	15	15	22	14.2	20
Meramec: Pacific, Mo.	11	5	6	12.6	6
<u>Missouri Basin</u>					
North Branch of Elkhorn: Pierce (nr), Nebr.	12	12	12	12.9	12
Grand:					
Chillicothe, Mo.	24	31	Apr. 1	26.2	Apr. 1
Sumner, Mo.	26	31	Apr. 1	31.5	Apr. 2
Brunswick, Mo.	12	Apr. 2	Apr. 5	13.5	Apr. 3
Chariton: Novinger, Mo.	20	30	Apr. 8	25.1	31
Lamine: Clifton City, Mo.	15	Apr. 4	Apr. 4	15.8	Apr. 4
<u>Ohio Basin</u>					
Green:					
Lock No. 6, Brownsville, Ky.	28	4	7	31.3	6
Lock No. 4, Woodbury, Ky.	33	4	9	38.7	6
Lock No. 2, Rumsey, Ky.	34	6	14	38.0	11
West Fork of White:					
Muncie, Ind.	6	4	4	7.0	4
Anderson, Ind.	10	4	5	12.2	5
Spencer, Ind.	14	4	8	17.3	5
Elliston, Ind.	18	5	9	23.2	7
Edwardsport, Ind.	12	5	12	19.7	8,9
		16	27	17.0	21
White: Petersburg, Ind.	16	6	12	19.4	10,11
Wabash:					
Bluffton, Ind.	10	6	7	11.0	6
Wabash, Ind.	12	4	7	17.5	5
Lafayette, Ind.	11	5	8	16.1	6
		16	21	14.2	16
Covington, Ind.	16	6	9	19.4	8
		16	22	17.9	18
Montezuma, Ind.	14	5	10	17.2	9
		15	24	19.2	19
Terre Haute, Ind.	14	5	11	15.2	9,10
		16	24	16.3	20
Vincennes, Ind.	16	24	25	16.2	24
Mc. Carmel, Ill.	17	10	13	17.2	12,13
		23	26	17.3	25
Salt: Taylorsville, Ky.	20	3	4	27.5	4
Boston, Ky.	38	4	6	41.2°	5
Ohio:					
Shawneetown, Ill.	33	9	12	33.8	11
Dam No. 50, Fords Ferry, Ill.	34	8	13	35.9	11
<u>White Basin</u>					
Black: Black Rock, Ark.	14	15	30	10.9	19
Little Red: Judsonia, Ark.	30	18	21	35.5	20
White:					
Angusta, Ark.	32	21	25	32.5	22



# FLOOD STAGE DATA

(All dates in March unless otherwise specified)

Table 5-Continued

MARCH 1963

River and station	Flood stage	Above flood stages -dates		Crest*	
		From--	To--	Stage	Date
<u>MISSISSIPPI SYSTEM (Cont'd.)</u>					
<u>White Basin (Cont'd.)</u>					
White: (Cont'd.)	<i>Ft.</i>			<i>Ft.</i>	
Georgetown, Ark.	21	20	**	23.3	24
Des Arc, Ark.	24	22	**	26.6	25
Clarendon, Ark.	26	21	**	29.3	28-29
St. Charles, Ark.	25	24	**	27.2	31
					-Apr. 1
<u>Arkansas Basin</u>					
Poteau: Poteau, Okla.	24	14	15	27.9°	14
		17	18	27.1°	18
Petit Jean: Danville, Ark.	20	18	20	23.9	19
<u>Red Basin</u>					
Saline: Benton, Ark.	20	18	18	21.0	18
Quachita:					
Arkadelphia, Ark.	17	10	19	18.0	18
Camden, Ark.	26	21	25	26.9	22
Sulphur:					
Naples, Tex.	22	15	17	22.5	16
		22	26	24.0	23
McCartney Bridge, Tex.	20	18	31	21.9	31

River and station	Flood stage	Above flood stages -dates		Crest*	
		From--	To--	Stage	Date
<u>MISSISSIPPI SYSTEM (Cont'd.)</u> <u>Lower Mississippi Basin</u>		<i>Ft.</i>		<i>Ft.</i>	
St. Francis: Fisk, Mo.	20	5	10	21.9	7&8
St. Francis, Ark.	18	13	20	18.6	15
		22	29	18.8	18
				19.1	23
Coldwater: Sarah, Miss.	18	23	**	19.0	22
Tallahatchie: Swan Lake, Miss.	26	23	Apr. 1	26.9	27
Yazoo: Yazoo City, Miss.	29	31	Apr. 7	29.2 <sup>B</sup>	Apr. 3
<u>WEST GULF OF MEXICO DRAINAGE</u>					
Sabine:					
Mincola, Tex.	14	13	15	14.6	14&15
Logansport, La.	25	13	20	28.6	16
Wilem, Tex.	35	14	23	38.9	17
Bon Wier, Tex.	17	15	30	19.9	20
Neches: Evadale, Tex.	16	26	**		
Trinity: Liberty, Tex.	24	17	23	25.1	20

\* Provisional  
 \*\* Continued at end of month  
 ° Highest stage reported, but not necessarily the crest  
 \* Estimated

# RADIOSONDE DATA

Average monthly values

Table 20

MARCH 1953

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. (836 MB.)				ATLANTA, GA. (983 MB.)				BIG SPRING, TEX. (924 MB.)				BISMARCK, N. DAK. (953 MB.)				BOISE, IDAHO (914 MB.)				BROWNSVILLE, TEX. (1013 MB.)				BUFFALO, N. Y. (990 MB.)			
	Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations			
	Dynamic height	Temperature	Relative humidity		Dynamic height	Temperature	Relative humidity		Dynamic height	Temperature	Relative humidity		Dynamic height	Temperature	Relative humidity		Dynamic height	Temperature	Relative humidity		Dynamic height	Temperature	Relative humidity		Dynamic height	Temperature	Relative humidity	
SURFACE	31	1,619	9.8	40	31	309	11.6	66	31	784	15.9	46	31	505	-2.5	80	31	868	6.4	56	31	7	21.7	85	31	221	1.3	8
1,000	31	98			31	160			31	97			31	122			31	118			31	119	21.3	83	31	138		
950	31	542			31	594	12.1	56	31	544			31	535	-3.0	72	31	549			31	571	19.7	73	31	555		75
900	31	1,004			31	1,045	10.4	56	31	1,003	16.8	39	31	963	-1.9	66	31	992	7.8	46	31	1,029	19.1	57	31	984	-1.4	72
850	31	1,479			31	1,519	8.1	50	31	1,489	14.6	36	31	1,417	-3.0	58	31	1,462	4.8	49	31	1,518	17.3	49	31	1,438	-3.4	70
800	31	1,984	8.2	35	31	2,017	5.7	48	31	1,998	11.6	32	31	1,896	-4.7	56	31	1,953	1.0	53	31	2,033	14.7	47	31	1,915	-5.4	65
750	31	2,514	4.1	38	31	2,548	3.1	45	31	2,538	7.8	34	31	2,410	-6.7	54	31	2,472	2.9	57	31	2,585	12.1	40	31	2,426	-7.5	63
700	31	3,070	-2.2	40	31	3,099	1.2	42	31	3,098	3.6	36	31	2,938	-9.1	53	31	3,011	-6.8	62	31	3,152	9.0	36	31	2,955	-10.0	60
650	31	3,659	-4.6	42	31	3,692	-3.3	44	31	3,697	8.8	39	31	3,517	-11.9	45	31	3,594	-10.4	58	31	3,766	4.6	36	30	3,529	-13.7	58
600	31	4,283	-9.4	43	31	4,319	-6.8		31	4,329	-5.0	37	31	4,117	-15.5	44	31	4,198	-14.2	57	31	4,407	-4.9	37	30	4,127	-16.8	55
550	31	4,952	-14.1	44	31	4,997	-10.8		31	5,010	-10.0	38	31	4,775	-19.7	46	31	4,853	-18.5	54	31	5,101	-4.9	37	30	4,779	-20.9	52
500	31	5,667	-18.8	42	31	5,720	-15.4	35	31	5,734	-15.3	39	31	5,468	-24.7	46	31	5,556	-23.3	49	31	5,839	-10.3	33	30	5,473	-25.4	47
450	31	6,448	-24.2		31	6,510	-20.7	41	31	6,527	-20.9		31	6,253	-30.4	48	31	6,324	-28.8	45	31	6,654	-16.1	32	30	6,234	-30.6	44
400	31	7,291	-30.6		31	7,368	-26.8	41	31	7,381	-27.3		30	7,055	-36.5	43	31	7,152	-34.9	44	31	7,519	-22.5	33	30	7,057	-36.6	41
350	31	8,226	-37.8		31	8,318	-33.9	41	31	8,328	-34.3		30	7,966	-43.4		29	8,067	-42.1		31	8,482	-30.2		30	7,969	-42.7	
300	31	9,272	-45.1		31	9,380	-42.3		31	9,388	-42.2		30	8,986	-50.5		29	9,093	-49.6		30	9,557	-38.9		30	8,995	-48.4	
250	31	10,470	-52.5		31	10,588	-51.8		31	10,595	-51.4		29	10,165	-55.6		29	10,268	-56.1		30	10,779	-49.0		30	10,182	-52.6	
200	30	11,892	-58.0		31	12,005	-59.4		29	12,010	-58.0		28	11,575	-55.4		28	11,684	-56.4		30	12,211	-57.8		29	11,616	-54.0	
175	30	12,734	-57.2		30	12,842	-58.9		28	12,854	-58.0		28	12,428	-64.2		28	12,529	-55.9		29	13,050	-59.8		28	12,470	-53.8	
150	30	13,707	-58.0		30	13,807	-60.0		25	13,818	-58.8		28	13,417	-54.0		27	13,510	-55.7		28	14,003	-63.3		28	13,459	-53.9	
125	29	14,849	-60.0		28	14,934	-62.9		25	14,951	-62.3		27	14,585	-54.6		26	14,669	-55.9		28	15,111	-67.9		24	14,632	-54.7	
100	26	16,229	-63.0		25	16,292	-65.9		23	16,312	-65.1		26	16,011	-56.0		26	16,086	-57.2		23	16,439	-72.2		20	16,055	-55.5	
80	24	17,605	-62.4	35	20	17,644	-66.4		18	17,673	-65.5		23	17,431	-56.4		24	17,497	-57.0		17	17,748	-72.6		18	17,484	-56.9	
60	15	19,387	-62.0		16	19,392	-63.8		16	19,427	-64.0		17	19,237	-56.1		22	19,318	-57.0		14	19,454	-68.5		11	19,284	-57.2	
50	14	20,519	-60.3		13	20,519	-61.2		13	20,552	-62.2		14	20,403	-55.6		22	20,474	-56.0		13	20,558	-63.4		10	20,444	-57.6	
40	10	21,919	-57.1		10	21,904	-58.6		9	21,950	-57.2		10	21,823	-55.4		15	21,908	-54.7		8	21,942	-57.8		9	21,856	-56.4	
30					5	23,701	-54.9						5	23,666	-53.6		10	23,773	-52.4		5	23,815	-51.4					

Standard pressure surface (mb.)	BURRWOOD, IA. (1018 MB.)				CARIBOU, ME. (994 MB.)				CHARLESTON, S. C. (1017 MB.)				COLUMBIA, MO. (987 MB.)				DODGE CITY, KANS. (922 MB.)				EL PASO, TEX. (880 MB.)				ELY, NEV. (806 MB.)			
	Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations			
	Dynamic height	Temperature	Relative humidity		Dynamic height	Temperature	Relative humidity		Dynamic height	Temperature	Relative humidity		Dynamic height	Temperature	Relative humidity		Dynamic height	Temperature	Relative humidity		Dynamic height	Temperature	Relative humidity		Dynamic height	Temperature	Relative humidity	
SURFACE	31	3	17.9	90	31	191	-4.2	70	31	13	13.9	78	31	238	7.0	66	31	792	8.1	58	31	1,195	16.0	31	31	1,908	2.6	44
1,000	31	153	19.1	78	31	140	-6.5		31	152	15.7	62	31	130			31	112			31	88			31	116		
950	31	599	17.3	67	31	547	-5.0	67	31	593	14.4	56	31	558	7.2	60	31	544			31	542			31	549		
900	31	1,053	15.5	55	31	969	-5.6	70	31	1,042	11.6	55	31	997	5.3	59	31	994	9.1	50	31	1,005			31	1,001		
850	31	1,536	13.0	47	31	1,416	-6.5	73	31	1,517	8.8	52	31	1,463	3.7	55	31	1,466	7.2	47	31	1,488	15.3	26	31	1,470		
800	31	2,044	10.5	46	31	1,889	-8.0	71	31	2,016	5.9	50	31	1,954	1.4	53	31	1,964	5.9	39	31	1,997	11.5	28	31	1,967	4.3	37
750	31	2,591	7.4	40	31	2,392	-10.2	69	31	2,553	3.1	48	31	2,477	-1.2	46	31	2,491	2.9	33	31	2,536	7.3	31	31	2,494	1.3	37
700	31	3,144	4.6	36	31	2,918	-12.7	65	31	3,098	1.1	46	31	3,018	-4.1	46	31	3,044	-1.0	36	31	3,094	3.0	34	31	3,041	-3.3	41
650	31	3,746	1.5	36	31	3,486	-15.8	64	31	3,695	-3.0	42	31	3,606	-7.3	42	31	3,634	-5.2	37	31	3,693	-1.2	34	31	3,627	-8.0	45
600	29	4,383	-2.4	35	31	4,080	-19.1	59	31	4,318	-6.6	38	31	4,219	-10.9	39	31	4,254	-9.7	35	31	4,323	-5.5	34	31	4,239	-12.3	45
550	29	5,066	-6.8	36	31	4,722	-23.3	55	31	4,997	-11.2	39	31	4,890	-15.2	37	31	4,919	-14.6	37	31	5,000	-10.1		31	4,899	-16.9	44
500	29	5,805	-11.6		30	5,407	-27.9	52	31	5,718	-16.0		31	5,596	-20.0	33	31	5,633	-20.0	38	31	5,726	-15.4		31	5,607	-21.5	36
450	29	6,613	-17.4		30	6,163	-32.9		31	6,514	-21.0	38	31	6,379	-25.2	32	31	6,411	-25.0	39	31	6,518	-21.2		31	6,380	-26.8	
400	29	7,477	-23.7		30	6,975	-38.8		30	7,359	-26.8	41	31	7,214	-31.5	34	31	7,251	-30.9		31	7,371	-27.3		31	7,214	-33.1	
350	29	8,436	-31.5		30	7,979	-44.8		30	8,308	-33.9	41	31	8,145	-38.1	35	31	8,183	-38.0		31	8,317	-34.4		31	8,139	-40.0	
300	29	9,506	-40.3		30	8,997	-49.5		30	9,369	-42.1		31	9,198	-45.6		31	9,227	-45.3		31	9,376	-42.5		31	9,173	-47.8	
250	29	10,721	-50.2		30	10,079	-52.9		30	10,576	-51.6		31	10,381	-52.9		31	10,423	-52.2		31	10,581	-51.3		30	10,479	-55.6	
200	29	12,147	-57.9		29	11,511	-54.4		30	11,994	-58.7																	



## Average monthly values

MARCH 1953

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

# RADIOSONDE DATA

Average monthly value

Table 20—Continued

MARCH 1953

Standard pressure surface (mb.)	SAN ANTONIO, TEX. ( 986 MB.)				SAN JUAN, P. R. (1016 MB.)				SANTA MARIA, CALIF. (1009 MB.)				S. STE. MARIE, MICH. ( 989 MB.)				SPOKANE, WASH. ( 929 MB.)				SWAN ISLAND, W. I. (1014 MB.)				TACUBAYA, MEXICO ( 772 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	243	19.4	67	31	19	23.9	77	31	71	10.5	75	31	221	- 3.2	81	31	722	4.9	66	31	10	25.3	77	31	2,306	19.6	39
1,000	31	123			31	157	23.0	76	31	146	11.2	70	31	131		77	31	115			31	135	24.7	76	31	16		
950	31	569	19.4	62	31	604	19.6	80	31	578	10.1	60	31	539	- 3.5	77	31	544			31	586	21.0	79	31	485		
900	31	1,030	16.7	62	31	1,066	16.3	79	31	1,023	8.9	52	31	965	- 4.8	74	31	984	4.8	57	31	1,051	17.9	74	31	967		
850	31	1,515	14.2	56	31	1,551	13.5	75	31	1,493	6.3	47	31	1,413	- 6.1	70	31	1,447	1.5	57	31	1,538	15.3	64	31	1,466		
800	31	2,025	12.3	46	31	2,059	11.0	65	31	1,989	4.4	37	31	1,886	- 7.4	63	31	1,932	- 2.1	58	31	2,050	12.7	55	31	2,001		
750	31	2,567	9.5	43	31	2,604	9.6	43	31	2,517	1.8	30	31	2,391	- 9.5	61	31	2,445	- 6.0	58	31	2,596	10.2	45	31	2,561	18.0	36
700	31	3,132	6.0	39	31	3,167	7.9	27	31	3,064	- 1.1	26	31	2,917	-11.9	61	31	2,977	- 9.8	58	31	3,162	9.0		31	3,143	13.3	39
650	31	3,736	2.0	35	31	3,766	5.0		31	3,656	- 4.3		31	3,487	-14.9	57	31	3,552	-13.4	53	31	3,781	6.5		31	3,768	8.1	46
600	31	4,376	- 2.2	32	31	4,424	1.7		31	4,278	- 8.3		31	4,083	-18.1	53	31	4,149	-17.3	51	31	4,425	3.3		31	4,416	2.7	53
550	31	5,058	- 7.1		31	5,124	- 2.3		31	4,947	-13.1		31	4,729	-21.8	51	31	4,799	-21.5	48	31	5,125	- 6.6		31	5,118	- 2.5	49
500	31	5,797	-12.4	34	31	5,869	- 7.3		31	5,666	-18.4		31	5,424	-26.3	48	31	5,490	-26.3	47	31	5,880	- 5.8		31	5,863	- 7.3	35
450	31	6,595	-18.2		31	6,696	-13.1		31	6,447	-24.4		31	6,181	-31.7	47	31	6,248	-31.5	46	31	6,700	-11.8		31	6,685	-12.8	
400	31	7,464	-24.4		31	7,567	-20.1		31	7,290	-30.9		31	7,001	-37.8	44	31	7,067	-37.3	46	31	7,584	-19.4		31	7,564	-19.0	
350	31	8,421	-31.6	36	31	8,541	-27.4		31	8,223	-38.2		31	7,908	-44.3		31	7,975	-44.0		31	8,562	-26.7		31	8,543	-26.5	
300	31	9,491	-40.4		31	9,632	-35.4		31	9,265	-46.0		31	8,927	-49.8		31	8,992	-50.9		31	9,655	-35.1		31	9,634	-35.4	
250	31	10,705	-50.4		31	10,878	-43.9		31	10,454	-54.2		31	10,124	-53.5		31	10,162	-56.1		31	10,899	-44.1		31	10,878	-45.4	
200	31	12,127	-59.1		31	12,343	-53.9		31	12,698	-58.3		31	12,419	-53.3		31	12,422	-55.3		31	13,209	-59.0		31	13,188	-59.0	
175	31	12,961	-60.0		31	13,188	-59.6		31	13,671	-58.1		31	13,414	-53.2		31	13,407	-54.3		31	14,162	-64.6		31	14,147	-64.1	
150	31	13,918	-61.8		31	14,139	-65.1		31	14,814	-59.9		31	14,585	-54.0		31	14,576	-54.5		31	15,256	-70.7		31	15,246	-70.3	
125	31	15,039	-65.7		31	15,231	-71.4		31	16,199	-61.5		31	16,011	-54.9		31	16,000	-55.7		31	16,556	-76.7		31	16,552	-76.0	
100	31	16,386	-68.7		31	16,528	-76.8		31	17,579	-61.7		31	17,434	-55.4		31	17,423	-55.6		31	17,832	-77.5		31	17,838	-75.6	
80	31	17,712	-69.8		31	17,804	-77.3		31	19,372	-60.5		31	19,255	-56.1		31	19,256	-55.3		31	19,494	-72.3		31	19,511	-71.4	
60	31	19,437	-67.2		31	19,476	-70.6		31	20,508	-59.2		31	20,418	-53.9		31	20,418	-53.8		31	20,573	-68.1		31	20,596	-67.4	
40	31	20,543	-64.2		31	20,573	-64.0		31	21,914	-56.2		31	21,814	-55.6		31	21,852	-52.6		31	21,933	-62.1		31	21,954	-62.6	
30	31	21,922	-60.0		31	21,961	-57.4		31	23,797	-52.4		31	23,765	-53.1		31	23,707	-52.2		31	23,747	-55.1		31	23,772	-56.1	
20	31	23,736	-54.0																									
15																												

Standard pressure surface (mb.)	TAMPA, FLA. (1018 MB.)				TATOOSH ISLAND, WASH. (1011 MB.)				VERACRUZ, MEXICO (1010 MB.)				WASHINGTON, D. C. (1008 MB.)				CAMAGUEY, CUBA (1005 MB.)				HAVANA, CUBA (1013 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	9	19.0	91	31	31	6.6	82	31	12	25.2	83	31	88	6.6	67	24	122	21.1	89	31	49	20.3	80
1,000	31	163	19.8	72	31	121	6.0	79	31	96	24.5	82	31	151	6.7	65	24	164	21.1	89	31	163	20.5	75
950	31	606	18.2	64	31	541	3.4	77	31	543	23.6	66	31	576	5.7	64	24	613	20.0	80	31	608	18.1	73
900	31	1,066	15.5	61	31	976	.5	73	31	1,019	22.0	54	31	1,013	3.4	66	24	1,074	17.9	75	31	1,067	14.9	75
850	31	1,549	12.7	60	31	1,433	- 2.2	73	31	1,513	19.1	50	31	1,474	.8	67	24	1,562	15.0	75	31	1,549	12.1	68
800	31	2,055	10.0	50	31	1,912	- 4.9	69	31	2,032	15.7	48	31	1,960	- 1.1	67	24	2,073	12.2	65	31	2,055	9.9	57
750	31	2,599	7.5	42	31	2,422	- 7.5	63	31	2,581	12.4	43	31	2,476	- 3.5	61	24	2,619	10.5		31	2,596	8.0	41
700	31	3,155	4.8	37	31	2,951	-10.7	60	31	3,152	9.5	34	31	3,015	- 5.8	58	24	3,185	8.4		31	3,156	5.7	
650	31	3,761	1.6	36	31	3,523	-14.4	57	31	3,770	6.6		31	3,596	- 8.9	50	24	3,802	5.5		31	3,766	2.4	
600	31	4,397	- 1.9	35	31	4,119	-18.0	52	31	4,417	2.5		31	4,205	-12.3	44	24	4,445	1.8		31	4,402	- 1.6	
550	31	5,086	- 6.1	35	31	4,766	-22.2	48	31	5,115	- 1.6		31	4,866	-16.5	40	24	5,145	- 2.4		31	5,088	- 5.6	
500	31	5,823	-10.8		31	5,457	-27.1	47	31	5,869	- 6.4		31	5,574	-21.4	38	24	5,891	- 7.4		31	5,830	-10.6	
450	31	6,637	-16.7		31	6,212	-32.5	46	31	6,690	-12.2		31	6,356	-26.6	36	24	6,710	-13.2		31	6,639	-16.4	
400	31	7,498	-23.5		31	7,028	-38.3		31	7,574	-19.3		31	7,188	-32.3		24	7,591	-19.6		31	7,508	-23.0	
350	31	8,458	-31.2		31	7,933	-44.7		31	8,553	-26.8		31	8,116	-38.9		24	8,568	-27.0		31	8,473	-29.7	
300	31	9,540	-39.8		31	8,954	-51.4		31	9,647	-35.4		31	9,187	-45.4		24	9,658	-35.5		31	9,555	-37.5	
250	31	10,747	-49.9		31	10,125	-56.5		31	10,892	-44.6		31	10,351	-52.9		24	10,903	-44.4		31	10,790	-45.9	
200	31	12,174	-58.1		31	11,536	-57.0		31	12,354	-54.4		31	11,771	-56.5		24	12,373	-53.4		31	12,247	-54.1	
175	31	13,010	-59.9		31	12,382	-55.9		31	13,201	-59.3		31	12,610	-56.0		24	13,225	-57.3		31	13,096	-58.2	
150	31	13,967	-62.7		31	13,365	-54.5		31	14,156	-64.6		31	13,589	-56.3		24	14,188	-62.9		31	14,055	-63.4	
125	31	15,076	-67.5		31	14,531	-55.2		31	15,253	-70.7		31	14,741	-58.1		24	15,293	-69.8		31	15,159	-69.2	
100	31	16,406	-71.7																					



## Average monthly resultant winds

Table 21

MARCH 1953

[illegible]

18,000 m.,	21 obs.,	272 dir.,	13.4 speed
20,000 m.,	20 obs.,	284 dir.,	5.7 speed
22,000 m.,	22 obs.,	290 dir.,	4.9 speed
24,000 m.,	21 obs.,	288 dir.,	4.0 speed
26,000 m.,	15 obs.,	286 dir.,	5.9 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°; W = 270°); speeds in meters per second.

# RAWIN DATA

Average monthly resultant winds

Table 22

MARCH 1953

	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,479 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			Int. Falls, Minn. (358 m.)				
Altitude (meters) m s l	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations				
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed						
Surface	31	244	0.8	31	140	3.1	31	333	0.7	31	128	5.3	31	166	1.6	31	313	2.3	31	195	0.9	31	132	0.7	31	47	0.7	30	303	1.2	29	304	0.7	29	184	0.9		
500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
1,000	---	---	---	31	168	4.7	31	300	2.4	31	156	8.0	29	230	3.1	31	314	1.8	31	236	4.5	31	267	1.9	---	---	---	30	282	2.1	29	268	3.3	28	194	1.3		
1,500	---	---	---	31	213	5.9	28	263	3.5	31	169	6.0	29	256	4.3	30	288	2.8	31	269	7.0	31	257	7.4	30	47	6.6	30	267	5.0	28	279	5.9	29	238	4.1		
2,000	31	268	4.8	31	242	8.3	28	270	5.8	30	179	5.1	26	264	5.0	29	292	3.5	30	274	8.6	31	265	9.1	30	256	2.5	30	276	8.7	27	287	9.7	23	296	4.5		
2,500	31	270	6.6	31	248	10.5	27	272	6.5	30	204	4.5	25	259	6.7	29	278	3.5	30	276	10.8	31	272	10.2	30	252	4.2	30	279	10.6	27	284	11.3	23	302	6.0		
3,000	31	264	8.5	31	251	12.9	27	275	8.1	30	227	5.0	24	260	9.3	29	277	3.6	29	283	12.7	31	274	12.5	30	248	5.5	30	280	12.8	26	281	11.6	28	303	7.2		
4,000	31	268	10.2	29	256	14.6	26	271	10.1	31	255	8.4	26	267	13.1	29	273	6.3	29	283	18.2	30	275	14.6	31	254	7.2	29	275	14.7	26	280	15.3	28	290	9.1		
5,000	31	273	13.3	26	259	17.2	26	277	12.8	31	257	11.1	25	263	16.2	28	280	6.4	26	271	20.1	29	277	17.2	31	264	10.6	28	273	19.0	25	276	17.6	28	291	13.0		
6,000	28	266	15.4	22	263	17.7	25	275	14.4	31	260	15.3	24	268	19.7	28	278	10.2	20	278	19.4	26	266	19.8	30	259	11.7	24	275	19.8	21	274	18.0	26	285	12.2		
8,000	22	265	18.8	20	267	23.9	22	268	18.6	29	262	18.7	21	263	22.8	27	288	12.7	14	276	23.2	21	274	25.4	24	269	15.0	18	274	22.1	14	282	18.1	25	286	18.2		
10,000	15	275	24.5	12	262	27.0	16	259	18.6	26	270	23.8	17	265	21.3	24	274	16.3	10	271	29.3	15	271	28.3	19	285	21.6	13	262	25.8	11	281	27.8	22	288	19.1		
12,000	---	---	---	---	---	---	13	260	19.6	18	265	27.8	13	269	29.9	21	263	15.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14,000	---	---	---	---	---	---	13	253	19.0	11	260	28.9	---	---	---	17	272	13.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
16,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	16	272	12.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
18,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	13	285	8.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
20,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	11	281	7.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	

	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P.R. (28 m.)			St. Cloud, Minn. (313 m.)			Santa Maria, Calif. (72 m.)					
Altitude (meters) m s l	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations					
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed							
Surface	31	199	0.7	31	302	1.5	31	153	1.3	29	255	0.9	30	233	1.0	31	259	2.2	31	142	2.6	31	358	1.6	31	85	2.8	31	85	4.7	31	282	0.5	31	287	2.5			
500	---	---	---	31	213	3.2	31	299	1.8	31	152	1.9	29	270	5.9	30	247	2.7	31	279	3.2	27	157	3.1	---	---	---	31	110	5.0	30	83	7.5	30	244	1.5	31	326	3.7
1,000	31	234	5.1	31	274	1.7	31	191	1.4	29	269	7.0	30	261	5.7	31	286	3.2	27	208	5.1	30	5	1.0	31	143	4.2	30	82	7.7	29	266	2.7	30	337	3.6			
1,500	30	251	7.4	31	229	2.7	31	251	1.7	28	275	7.2	29	272	6.9	31	297	3.4	27	245	6.9	30	294	5.3	31	183	5.0	30	78	6.9	28	292	5.2	30	345	2.6			
2,000	29	261	8.2	31	231	3.7	31	262	2.6	28	272	8.0	28	275	8.8	31	303	4.7	28	259	9.3	30	297	8.3	31	213	5.1	30	80	6.1	27	290	7.7	30	317	2.8			
2,500	29	272	10.3	31	250	5.1	31	265	4.1	26	275	10.0	28	276	10.6	30	292	5.0	30	264	11.1	31	295	10.8	31	231	6.3	31	75	5.9	27	293	9.1	31	309	4.1			
3,000	28	275	12.1	31	264	7.1	31	268	4.9	23	283	11.7	28	281	12.2	29	297	6.3	30	271	12.0	31	294	12.7	31	249	8.4	31	70	5.1	28	292	10.9	31	297	5.2			
4,000	26	285	15.2	29	256	8.2	31	281	7.0	22	277	13.2	27	279	15.4	28	290	8.4	30	274	15.3	31	282	13.8	31	257	12.8	31	54	3.2	24	273	9.9	31	285	8.4			
5,000	22	284	17.2	28	272	10.8	31	282	10.2	20	276	12.4	24	274	17.4	27	290	10.7	27	269	19.8	24	271	13.3	29	261	15.6	31	350	3.1	24	273	15.5	30	279	9.7			
6,000	20	285	19.0	23	276	13.4	31	281	13.5	16	278	12.4	21	271	20.8	26	284	11.4	24	268	21.4	23	268	14.7	26	265	17.9	31	329	5.1	24	266	18.0	29	281	11.3			
8,000	10	276	17.8	17	280	14.9	31	280	19.5	15	289	20.0	17	272	27.1	23	279	14.1	17	270	23.0	22	261	17.9	23	263	24.4	31	315	8.4	17	270	19.6	26	276	11.2			
10,000	---	---	---	15	273	16.1	29	284	20.8	10	276	22.1	11	266	30.0	17	297	15.0	12	269	26.7	15	257	20.2	15	259	28.3	30	291	17.6	14	259	23.2	25	281	13.9			
12,000	---	---	---	10	291	12.4	24	281	25.1	---	---	---	---	---	---	11	283	9.6	---	---	---	10	251	22.6	---	---	---	30	267	24.9	10	266	24.9	19	263	17.0			
14,000	---	---	---	---	---	---	21	282	29.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
16,000	---	---	---	---	---	---	15	291	20.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
18,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
20,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
22,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		

	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D.C. (88 m.)		
Altitude (meters) m s l	No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed	
Surface	31	9	0.8	31	194	2.0	29	180	1.6	31	318	1.2
500	31	70	2	---	---	---	27	208	4.4	29	302	3.6
1,000	31	272	1.7	31	214	4.8	26	218	5.4	29	293	7.3
1,500	29	288	2.6	31	242	6.4	27	232	6.6	30	284	9.3
2,000	28	304	3.4	30	244	6.6	25	244	6.9	30	284	10.5
2,500	28	307	4.5	30	253	6.5	24	259	7.5	31	281	11.7
3,000	28	294	5.0	30	262	6.8	24	274	7.4	31	280	12.8
4,000	26	275	6.9	30	275	9.0	20	258	9.7	30	277	15.5
5,000	25	280	10.9	29	269	11.3	19	257	11.7	30	278	17.7
6,000	21	280	9.7	25	248	12.2	17	236	13.1	29	276	22.7
8,000	18	267										



# SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun.

MARCH 1953

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
ALBUQUERQUE, N. MEX.									
Air mass									
	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08
March 1-22	Recorder Inoperative								
23	0.87	0.97	1.07	1.14		1.13	0.99	0.88	0.81
24	.89	.98	1.07	1.18		1.18	1.08		.91
27	.75	.85	.95	1.09		1.13	.95	.87	.77
28	.69	.80	.96	1.05					
29						.68			
30						1.07	.79		
31	.79	.88	.99	1.11		1.07	.91		.68
Averages	.80	.90	1.01	1.11		1.04	.94	.88	.79
Departures	-.14	-.15	-.14	-.19		-.27	-.25	-.22	-.22
BOSTON, MASS.									
Air mass									
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
March 6				1.24					
9						1.33	1.13	0.96	0.85
10	0.74	0.86	1.00			1.18	1.04		
11									
18			1.07						
19-23	Recorder Inoperative								
Averages	.74	.86	1.04	1.30		1.26	1.08	.96	.85
Departures	+.06	+.12	+.14	+.23		+.10	+.07	+.10	+.03
BLUE HILL, MASS.									
Air mass									
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
March 1						1.45	1.29	1.20	1.08
6	1.00	1.06	1.19	1.34					
9	1.04	1.12	1.23	1.40		1.39	1.24	1.09	
10						1.44	1.29	1.20	1.10
11	.93	1.01	1.16	1.29		1.34	1.20	1.07	.89
18	.96	1.06	1.20	1.35					
Averages	.93	1.06	1.20	1.35		1.41	1.26	1.14	1.02
Departures	+.10	+.09	+.14	+.10		+.16	+.19	+.19	+.18
TABLE MOUNTAIN, CALIF.									
Air mass									
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
March 7				1.48					
8				1.48					
Averages				1.48					
Departures				+.01					
MADISON, WIS.									
Air mass									
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
March 4		0.84	0.98						
5	0.88	.98	1.10	1.25					
16	.76	.86	.95						
17	.54	.63	.81	1.02					
19		.75	.95	1.14			1.21		
20			.77	.96					
27	.61	.74	.94	1.04			1.03		
28	.66	.80	.94	1.11					
Averages	.69	.80	.93	1.09			1.12		
Departures	-.10	-.13	.15	-.17			-.15		
LINCOLN, NEBR.									
Air mass									
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
March 5	0.79	0.90	1.03	1.18		1.16	1.01	0.86	
9	.68	.83	.99	1.16					
12	.92	1.01	1.09	1.22			1.20	1.05	
16							1.11	.96	.81
18							1.24	1.03	.86
19							1.07	.90	.79
Averages	.80	.91	1.04	1.19		1.16	.99	.83	.75
Departures	-.02	-.02	-.04	-.06		-.07	-.06	-.08	-.06
* Extrapolated									

\* Extrapolated

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of

pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

# SOLAR RADIATION DATA

MARCH 1953

**Table 31a** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

	5	6	7	8	9	10	11	Avg	12	13	14	15	16	17	18	Avg	19	20	21	22	23	24	25	Avg
Date-----	68	62	68	---	70	72	68	70	72	13	14	15	16	17	18	61	26	61	85	81	80	59	52	63
Langleys-----	26	27	28	29	30	31	1	Avg																
Date-----	77	44	53	26	8	25	60	42																
Langleys-----																								

**Table 31b** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

	5	6	7	8	9	10	11	Avg	12	13	14	15	16	17	18	Avg	19	20	21	22	23	24	25	Avg
Date-----	171	289	332	105	312	311	304	261	90	13	137	46	76	71	329	109	20	75	198	296	292	67	56	143
Langleys-----	26	27	28	29	30	31	1	Avg																
Date-----	175	38	40	25	10	26	113	61																
Langleys-----																								

**Table 31c** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

	5	6	7	8	9	10	11	Avg	12	13	14	15	16	17	18	Avg	19	20	21	22	23	24	25	Avg
Date-----	222	435	466	207	555	569	532	427	101	7	281	50	126	99	486	164	16	104	306	482	455	88	54	215
Langleys-----	26	27	28	29	30	31	1	Avg																
Date-----	145	36	49	27	12	23	102	57																
Langleys-----																								

**Table 31d** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

	5	6	7	8	9	10	11	Avg	12	13	14	15	16	17	18	Avg	19	20	21	22	23	24	25	Avg
Date-----	153	119	287	221	293	321	293	241	73	14	239	44	87	83	239	111	23	71	272	318	299	59	59	157
Langleys-----	26	27	28	29	30	31	1	Avg																
Date-----	82	43	48	26	9	36	64	44																
Langleys-----																								

**Table 31e** Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

	5	6	7	8	9	10	11	Avg	12	13	14	15	16	17	18	Avg	19	20	21	22	23	24	25	Avg
Date-----	110	69	96	186	59	47	49	88	---	---	140	85	147	143	144	116	50	129	134	76	93	110	92	97
Langleys-----	26	27	28	29	30	31	1	Avg																
Date-----	145	69	94	49	16	50	137	80																
Langleys-----																								

Note: Langley is the unit used to denote one gram calorie per square centimeter



## MARCH 1953

MARCH 1953

Accumulated Departures January 1 to April 1, 1953

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

\* Missing data March 16 through 24 due to moving of equipment.

1

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleyes. — Continued

MARCH 1953

	Las Vegas, Nev.	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBGO)	Madison, Wis.	Medford, Ore.	Miami, Fla.	Nashville, Tenn.	Newport, R. I.	New York, N.Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Put-in-Bay, Ohio	Rapid City, S. Dak.	Riverside, Calif.	Salt Lake City, Utah	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Saville, N.Y.	Schenectady, N.Y.	Seabrook, N.J.	Seattle, Wash. (WBAS)	Seattle, Wash. (U. of W.)	State College, Pa.	Stillwater, Okla.	Swan Is., B.W.I.	Tampa, Fla.	Upton, N.Y.	Washington, D.C. (Amer. U.)	Minneapolis, Manitoba		
1953	March 5-----	446	538	573	506	415	446	420	511	341	372	474	563	(230)	578	429	364	537	428	597	543	---	322	294	331	148	81	324	516	306	419	338	425	402		
	March 6-----	568	523	558	493	446	455	550	511	367	152	466	534	250	574	149	433	537	439	583	549	308	284	320	308	75	85	218	500	578	331	401	432			
	March 7-----	571	363	379	517	---	221	466	620	467	480	432	406	502	436	298	483	541	435	232	545	485	451	392	461	367	360	478	529	538	437	528	437	278		
	March 8-----	559	431	465	526	---	378	467	615	477	305	364	477	322	404	564	368	466	533	442	174	518	399	502	328	420	276	298	367	562	601	389	301	(343)		
	March 9-----	577	444	153	558	---	372	454	525	399	501	449	373	150	475	468	384	468	532	380	190	512	359	502	328	468	270	243	358	---	575	632	473	343		
	March 10-----	605	116	163	516	---	207	167	218	518	386	487	478	217	164	513	466	434	362	160	443	499	407	369	142	161	354	125	599	598	465	336	149			
	March 11-----	584	182	36	507	399	129	306	368	286	507	448	110	123	465	574	232	464	519	447	264	(584)	329	529	381	460	93	112	426	111	651	424	519	406	137	
	Averages-----	576	328	323	508	401	304	402	517	427	428	393	364	323	(412)	538	286	449	519	419	314	(532)	370	428	352	402	196	191	356	346	543	535	419	387	(276)	
	Departures-----	---	+	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	+	
	March 12-----	554	488	366	533	447	62	299	427	100	225	49	100	443	148	498	321	463	373	293	283	419	97	186	206	65	270	290	70	470	618	539	212	88	169	
	March 13-----	605	413	234	547	480	196	477	528	161	30	196	321	432	48	590	305	343	329	229	253	579	141	88	268	260	290	176	364	517	414	66	389	380		
	March 14-----	629	101	295	596	552	52	392	613	112	483	412	211	540	163	615	189	289	569	499	273	576	385	449	467	227	222	394	506	631	543	426	434	189		
	March 15-----	575	449	603	562	504	67	260	639	562	69	36	417	597	102	613	161	477	542	396	344	543	52	65	---	---	---	---	---	---	---	---	---	---	456	
	March 16-----	618	448	414	589	538	373	190	504	501	284	234	507	289	142	281	117	493	557	499	167	568	134	191	---	---	---	---	---	---	---	---	---	---	379	
	March 17-----	568	351	63	546	433	460	426	663	340	260	243	441	---	248	610	461	352	467	393	285	591	512	308	169	431	323	326	393	113	457	668	304	464	342	
	March 18-----	593	527	328	363	250	179	79	619	389	432	166	356	580	517	624	206	507	358	225	411	556	278	284	315	158	122	173	109	552	660	631	301	74	361	
	Averages-----	592	397	329	534	458	198	303	570	312	355	191	336	480	195	547	251	418	455	362	288	548	228	224	---	---	---	---	---	---	---	---	---	---	283	
	Departures-----	---	+	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	36
	March 19-----	446	587	513	409	512	250	514	612	62	136	539	584	119	631	243	427	530	219	505	(93)	169	65	57	419	458	429	460	542	645	641	51	528	404		
	March 20-----	625	366	508	580	582	282	161	600	609	284	291	498	585	131	522	482	317	580	223	591	(468)	424	340	241	321	290	347	389	541	646	538	361	459	34	
	March 21-----	614	290	268	650	592	471	169	586	222	485	416	181	513	507	603	464	400	558	215	507	459	439	530	422	518	(217)	272	513	---	---	---	---	457		
	March 22-----	653	116	92	622	583	444	215	416	140	---	483	180	532	512	638	227	375	612	131	519	495	228	377	146	520	163	132	501	---	---	---	---	269		
	March 23-----	648	417	584	597	583	357	462	449	---	430	57	475	108	466	177	427	614	590	654	(511)	365	537	371	440	383	328	70	416	647	538	499	236	417		
	March 24-----	628	528	596	634	474	287	142	544	---	124	39	439	586	86	584	361	555	560	519	653	442	63	43	---	---	---	---	---	---	---	---	---	228		
	March 25-----	413	549	630	497	480	123	510	---	---	85	190	342	551	370	548	320	490	566	439	604	528	241	179	276	131	353	32	90	567	536	724	154	89	532	
	Averages-----	590	393	466	567	515	331	279	545	395	208	284	319	547	317	596	325	427	564	334	576	(428)	286	327	222	391	(273)	270	350	525	633	547	314	374	336	
	Departures-----	---	+	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	35
	March 26-----	655	501	389	512	452	495	564	716	---	281	27	261	433	138	640	233	539	527	482	130	509	379	109	91	159	442	398	89	466	353	738	148	229	159	
	March 27-----	665	465	440	555	546	536	523	696	566	228	205	554	597	131	654	140	466	580	546	557	501	198	167	55	177	92	89	96	581	648	692	239	237	518	
	March 28-----	674	532	557	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	513
	March 29-----	596	295	607	687	500	539	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	249	
	March 30-----	687	102	298	649	576	148	259	708	305	68	77	336	327	225	647	256	520	593	228	309	582	298	99	41	312	242	217	471	266	634	712	93	520		
	March 31-----	690	62	317	662	603	59	614	655	269	146	368	200	620	271	658	243	477	580	453	607	505	445	187	555	264	223	563	505	631	703	358	371	515		
	April 1-----	658	485	613	637	576	90	610	715	543	412	128	560	544	290	668	31	211	589	278	204	362	498	266	111	251	500	438	129	579	641	706	262	383	366	
	Averages-----	632	349	460	617	499	333	478	693	482	215	179	404	509	(200)	618	188	445	522	375	399	499	404	215	133	319	333	263	287	491	607	681	198	386	406	
	Departures-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	426

Accumulated Departures January 1 to April 1, 1953

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.



## ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

MARCH 1953

Station	Day of month																																Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Baltimore, Md.-----	391	71	50	124	393	290	438	260	423	324	409	80	364	444	84	338	466	95	507	---	520	459	217	417	107	---	196	361	360	---	634	315	
Philadelphia, Pa.-----	421	80	58	46	231	152	439	413	438	369	429	50	206	445	---	281	403	146	388	292	443	444	373	100	135	114	145	274	261	339	532	282	

The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continu-

ous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in Illuminating Engineering, Vol. XLVI No. 2, pages 59 to 62.

NWRC, Asheville, N.C. — 6/24/53 — 2200





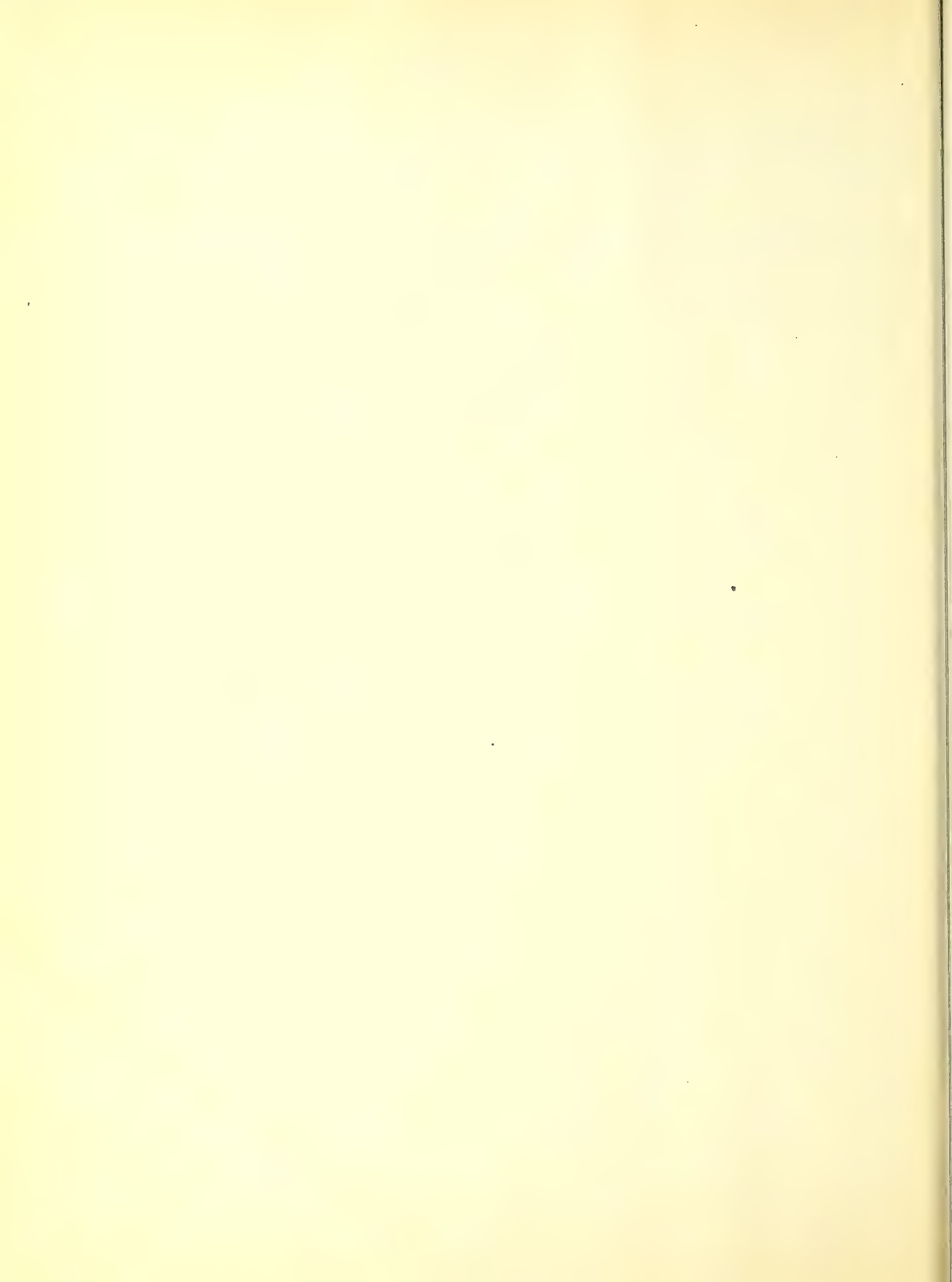
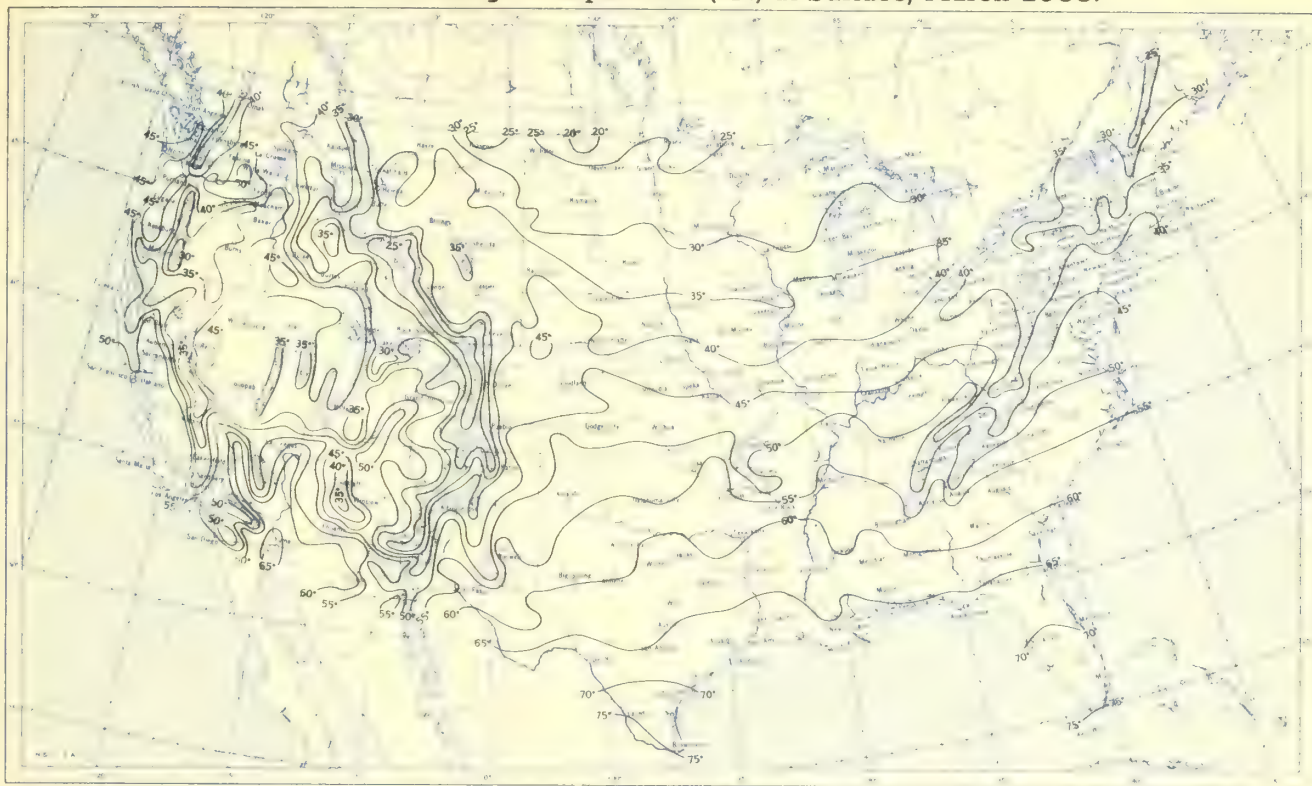
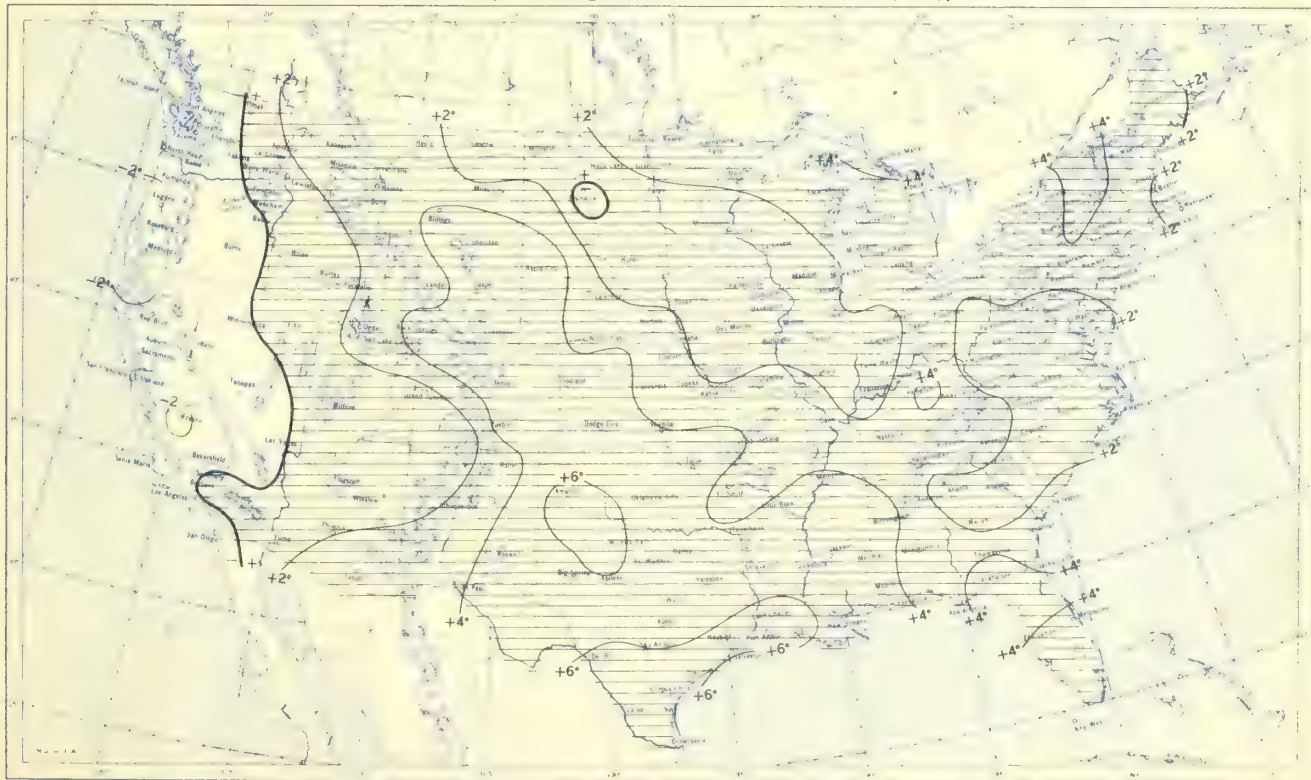


Chart I. A. Average Temperature ( $^{\circ}\text{F.}$ ) at Surface, March 1953.



B. Departure of Average Temperature from Normal ( $^{\circ}\text{F.}$ ), March 1953.

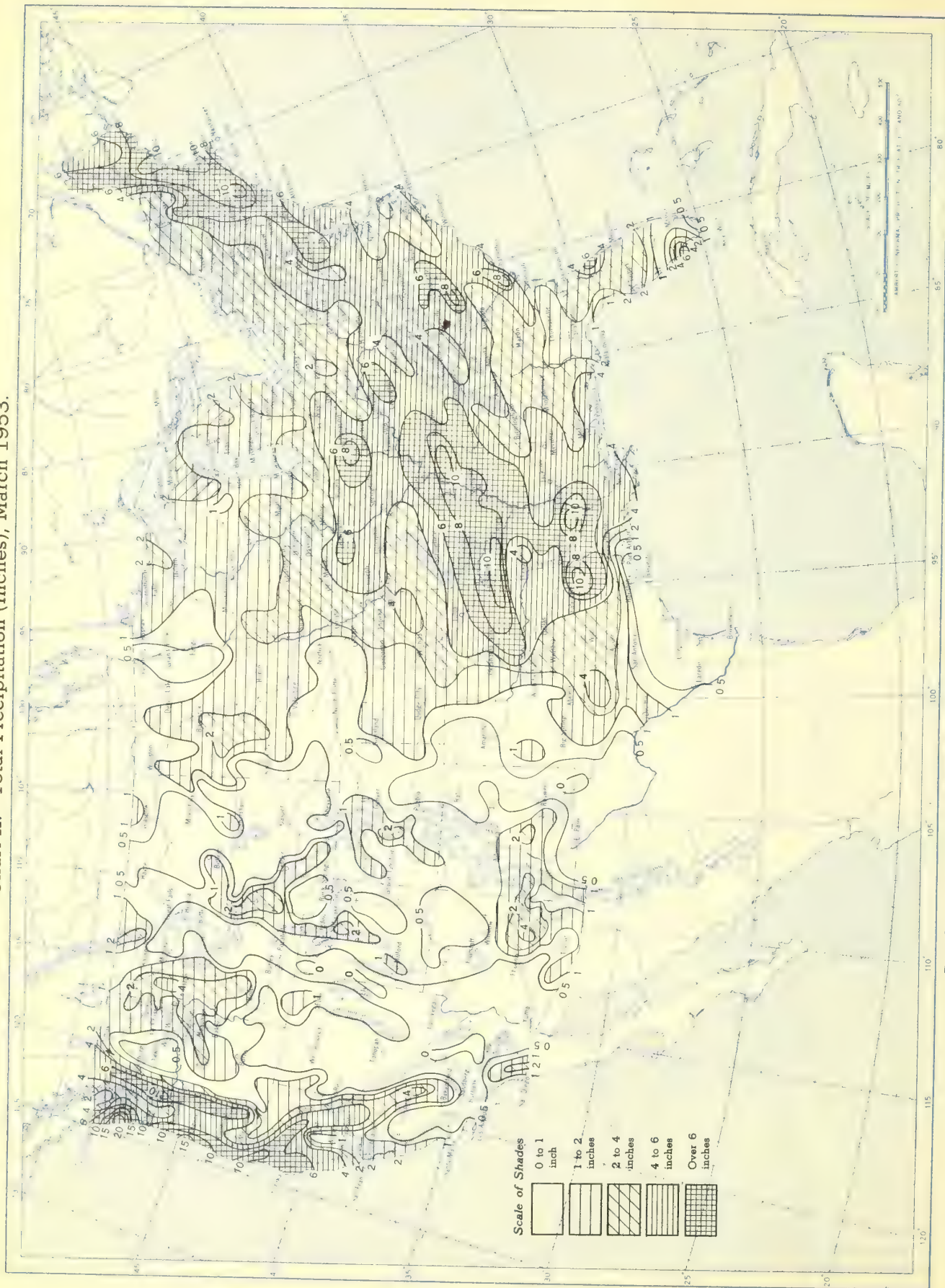


A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.



Chart II. Total Precipitation (Inches), March 1953.



Based on daily precipitation records at 800 Weather Bureau and cooperative stations.



Chart III. A. Departure of Precipitation from Normal (Inches), March 1953.



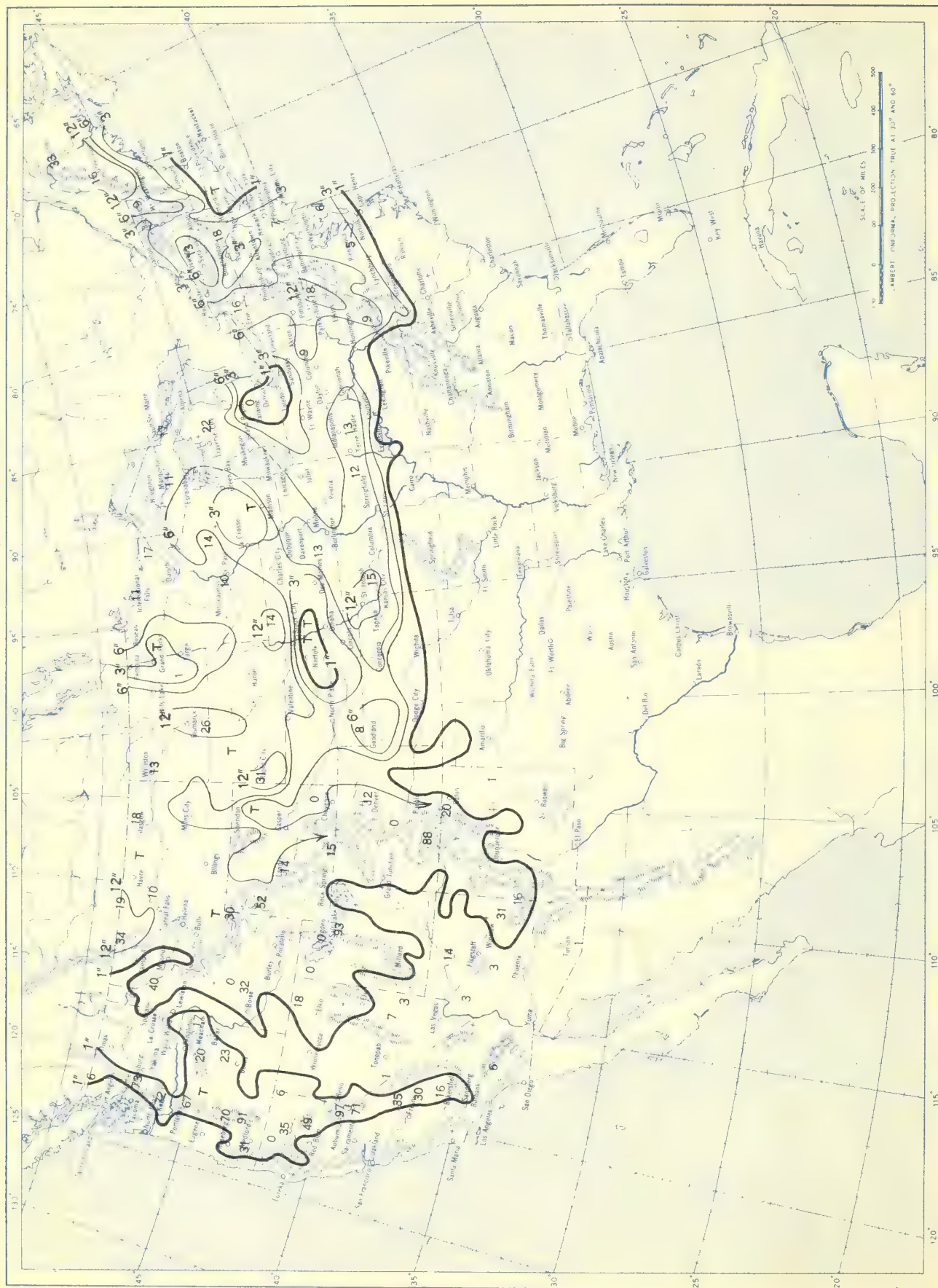
B. Percentage of Normal Precipitation, March 1953.



Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

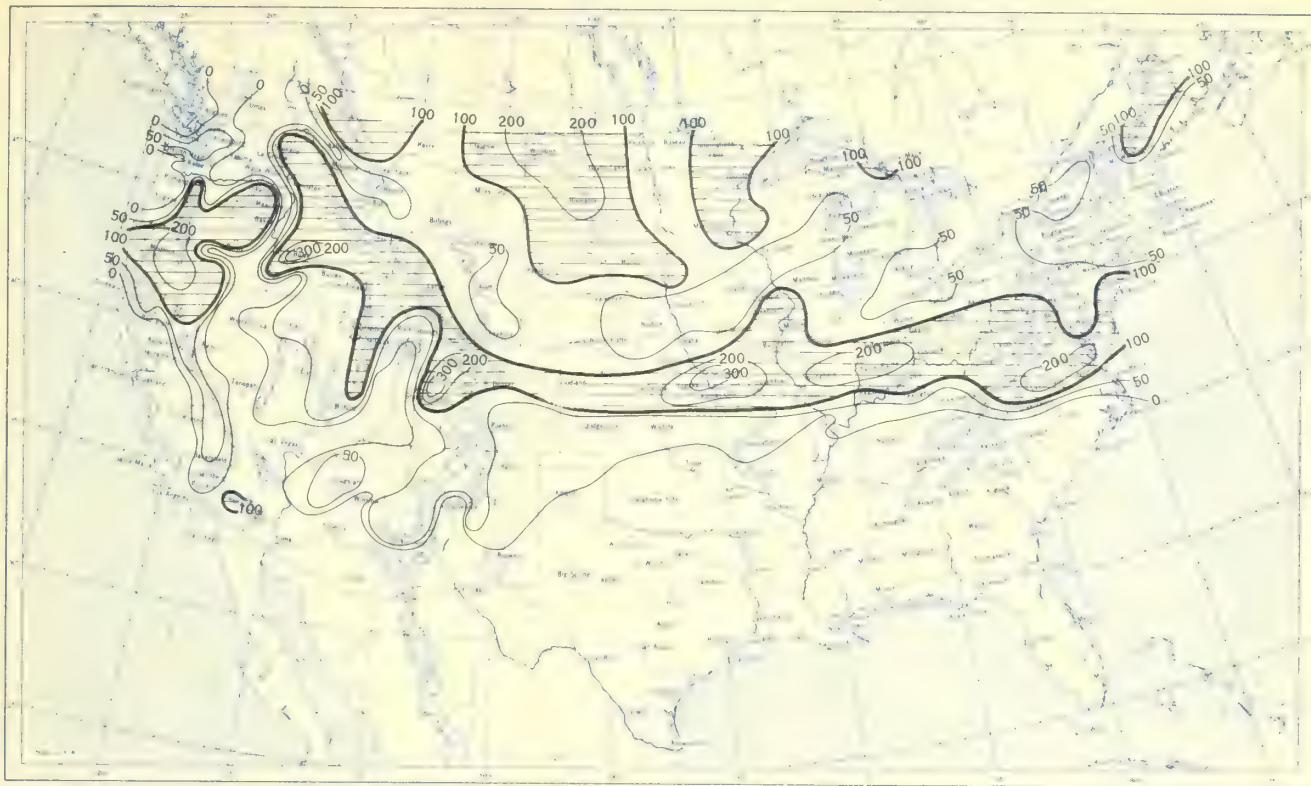


Chart IV. Total Snowfall (Inches), March 1953.



This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, March 1953.



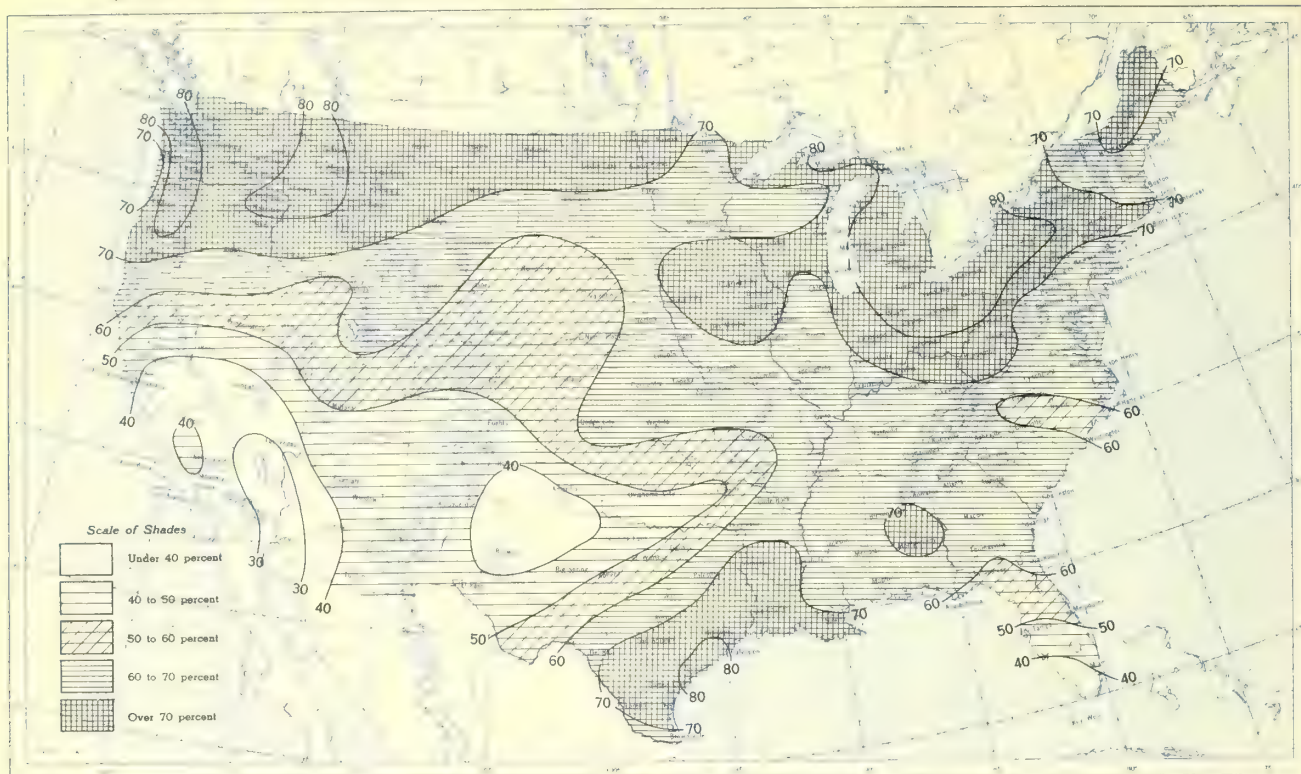
B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T., March 31, 1953.



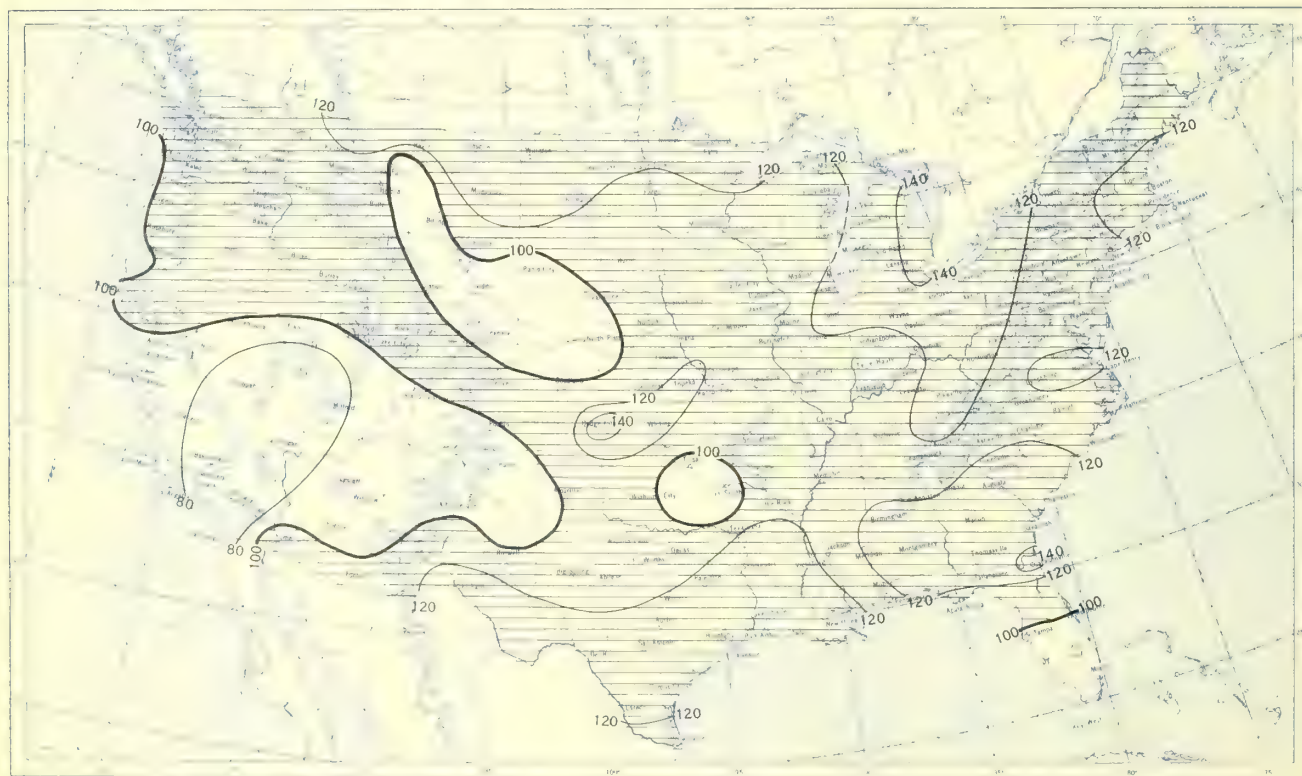
A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.  
 B. Shows depth currently on ground at 7:30 a. m. E. S. T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.



Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, March 1953.

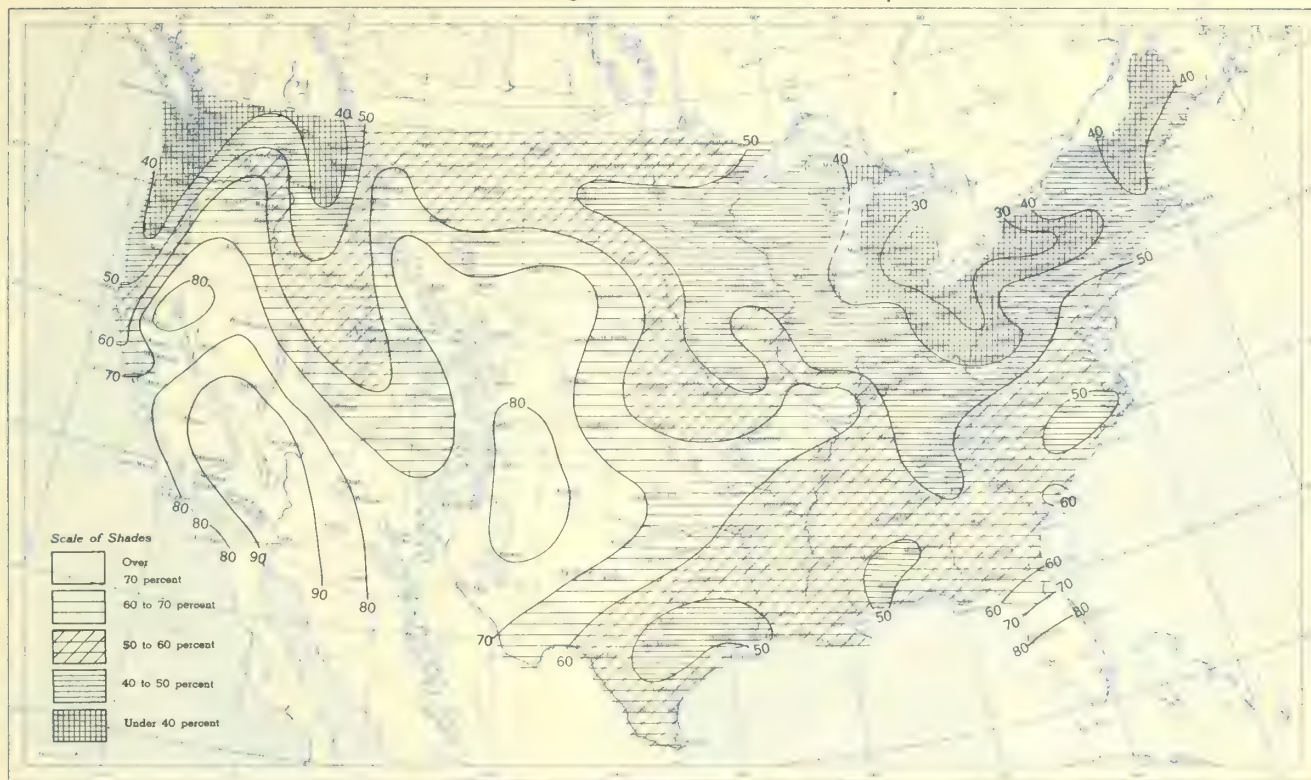


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, March 1953.

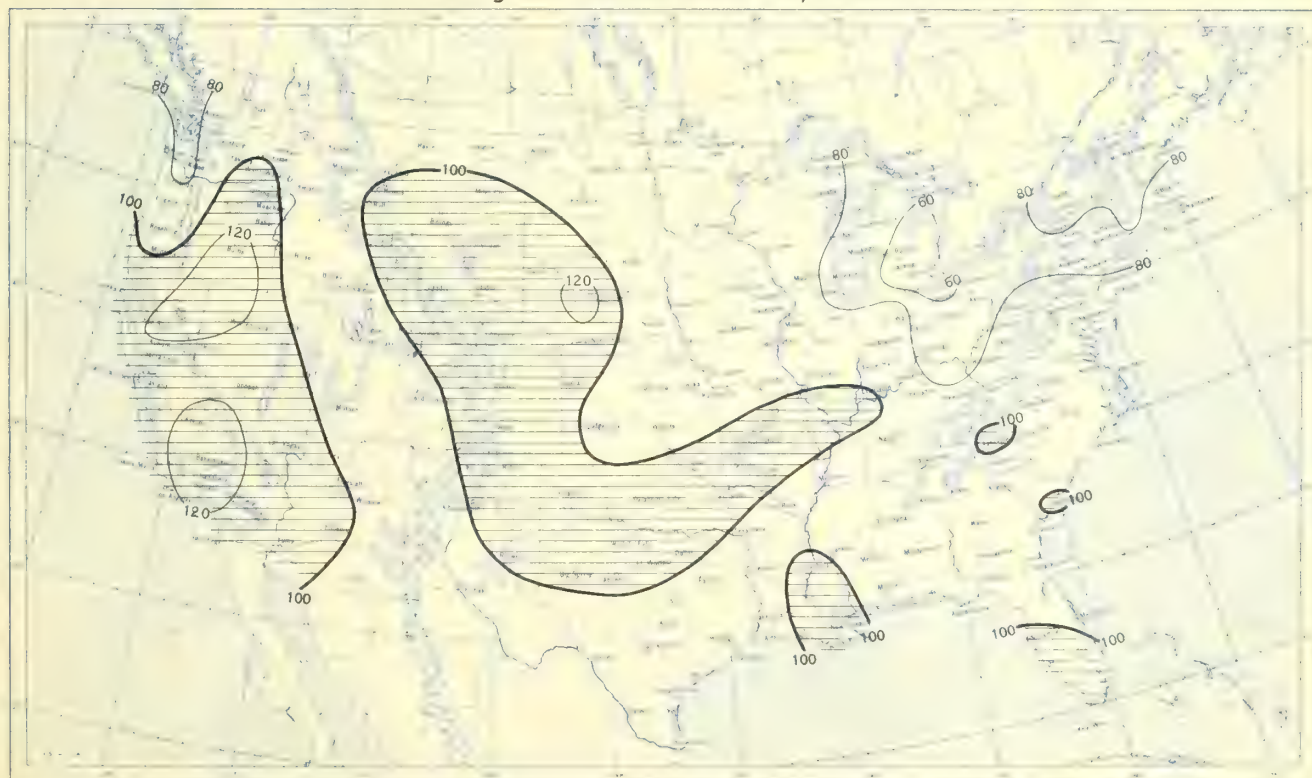


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, March 1953.



B. Percentage of Normal Sunshine, March 1953.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.



Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, March 1953. Inset: Percentage of Normal Average Daily Solar Radiation, March 1953.

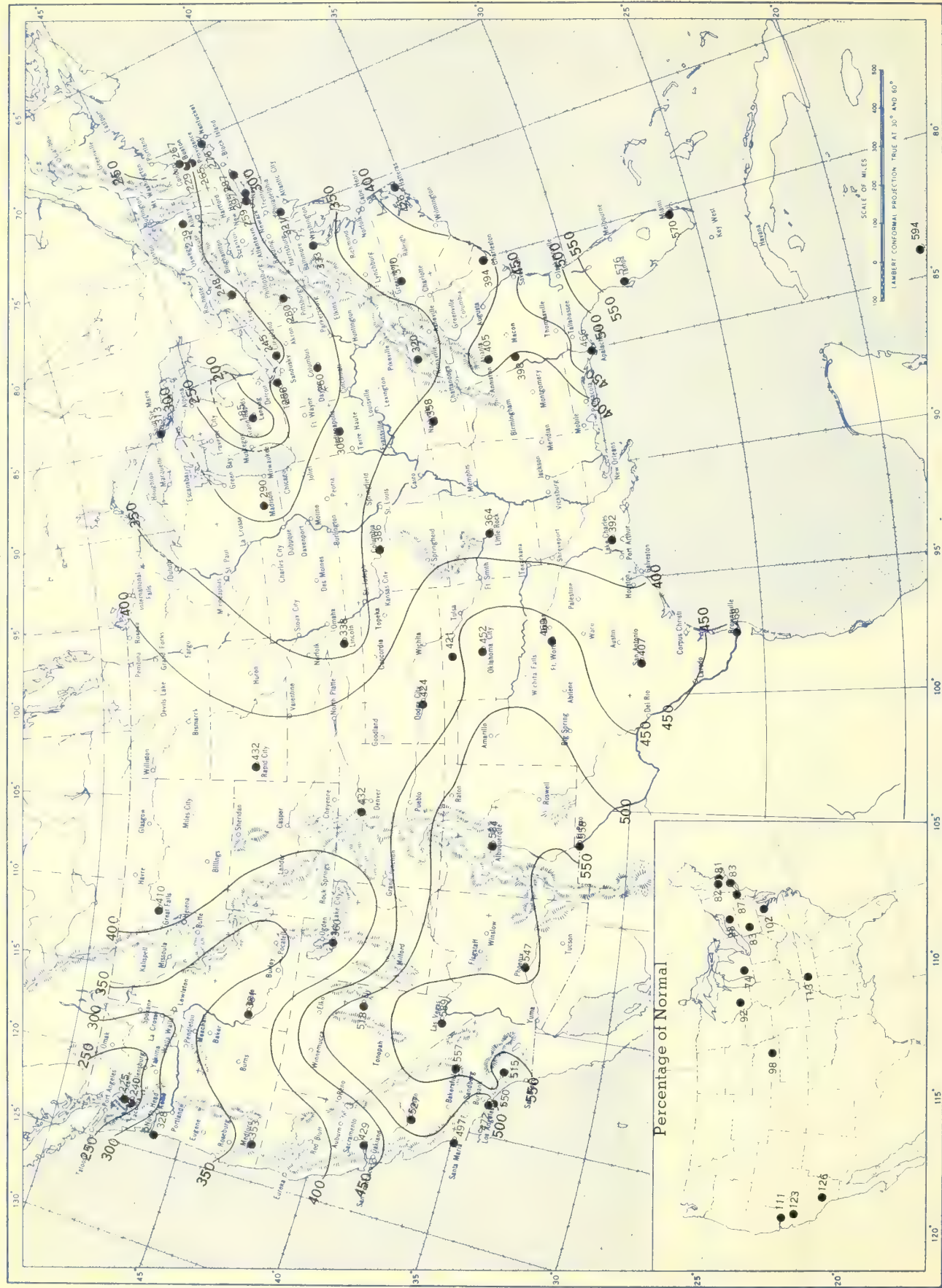
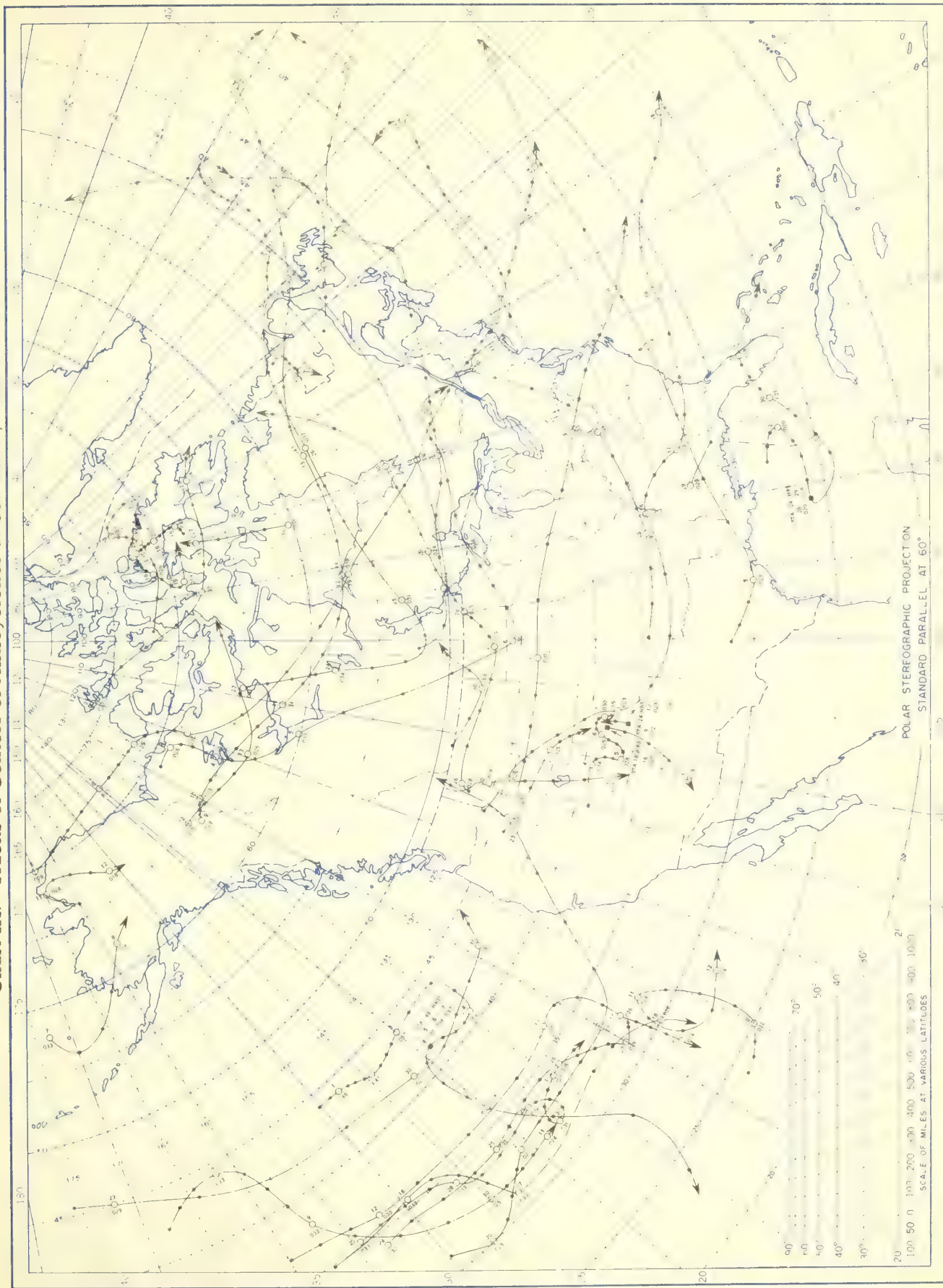


Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.<sup>-2</sup>). Basic data for isotherms are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

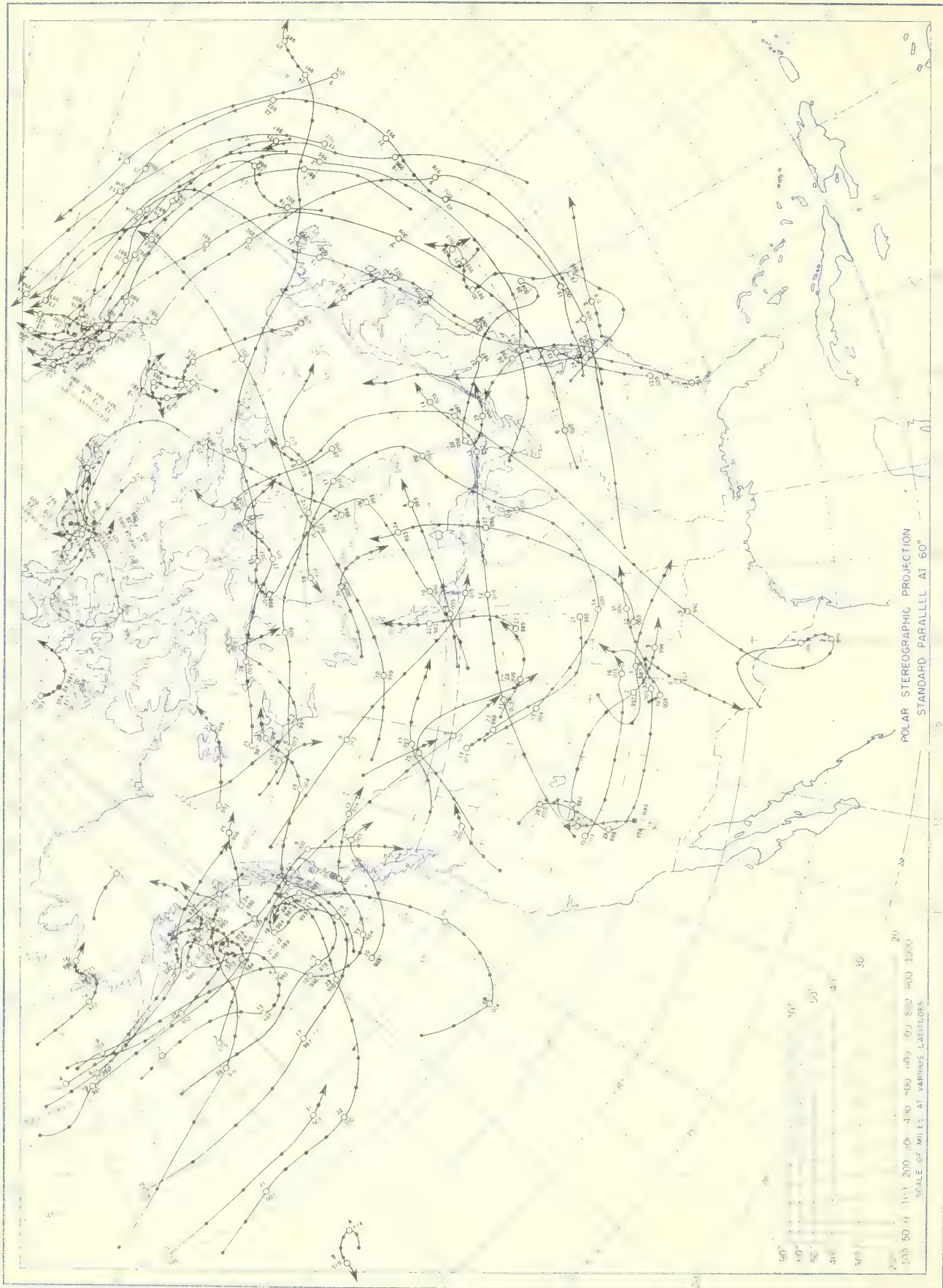
Chart IX. Tracks of Centers of Anticyclones at Sea Level, March 1953



Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar.  
Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

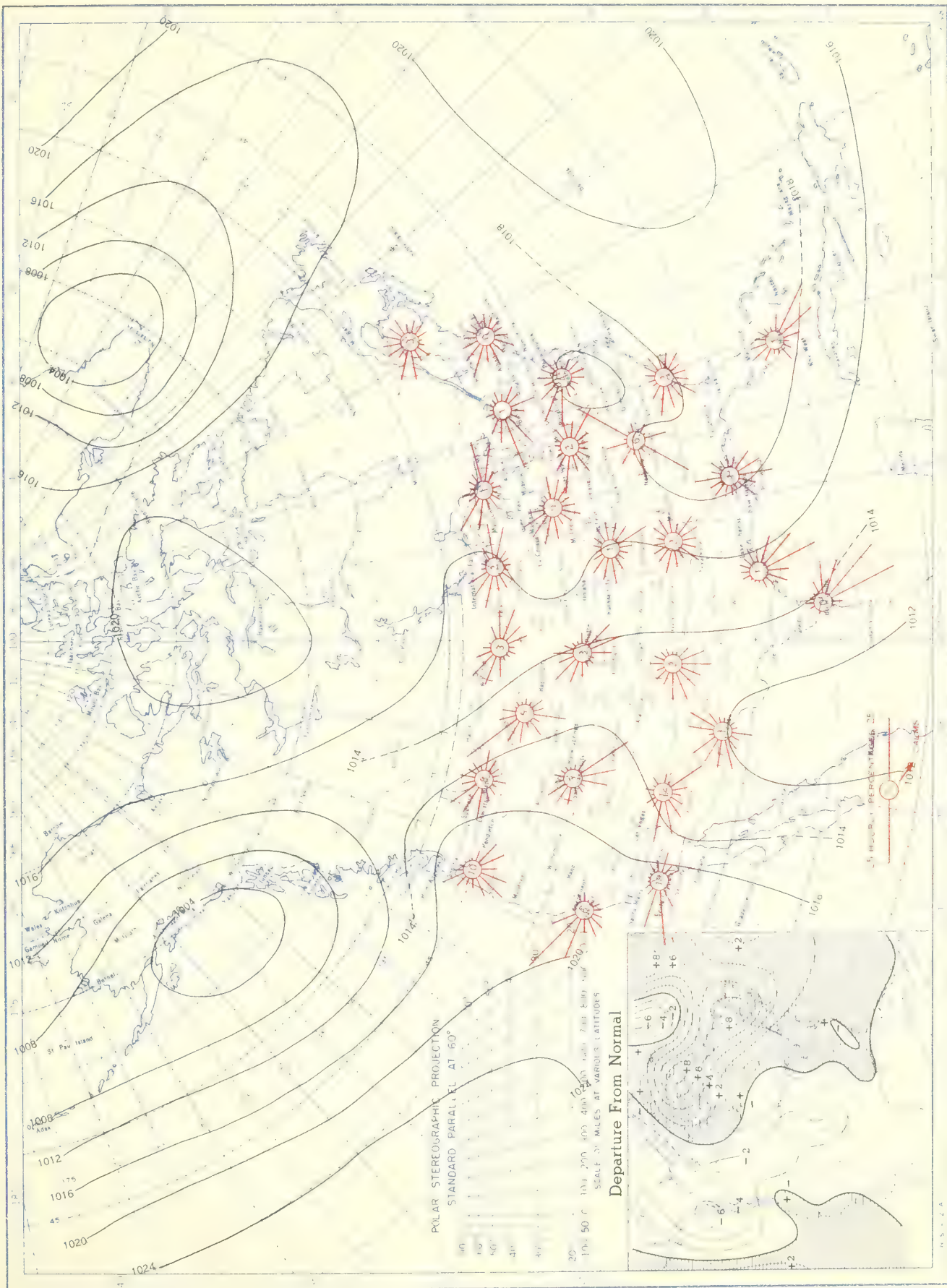


Chart X. Tracks of Centers of Cyclones at Sea Level, March 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

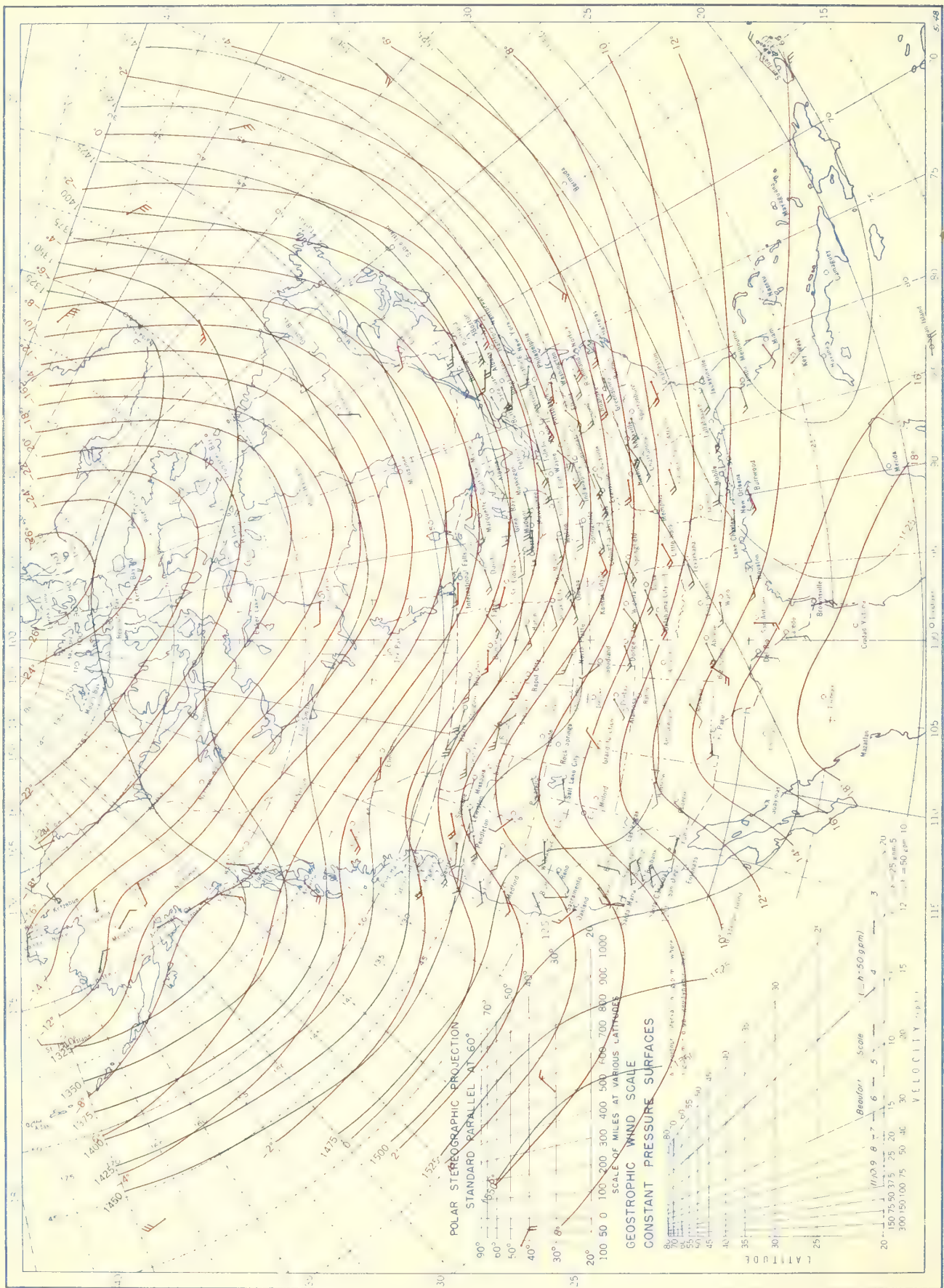
Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, March 1953. Inset: Departure of Average Pressure (mb.) from Normal, March 1953.



Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° inter-sections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.



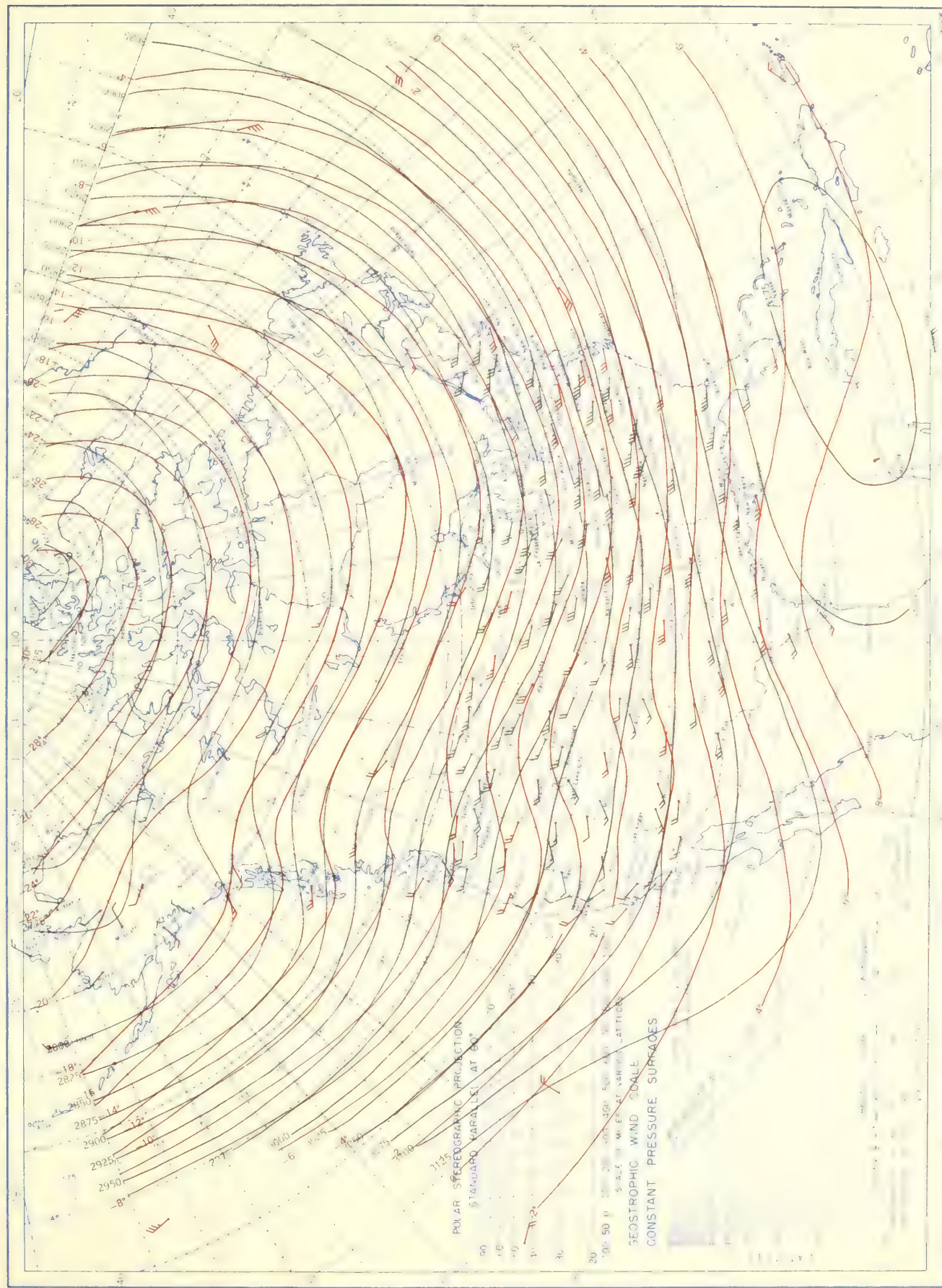
Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), March 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.



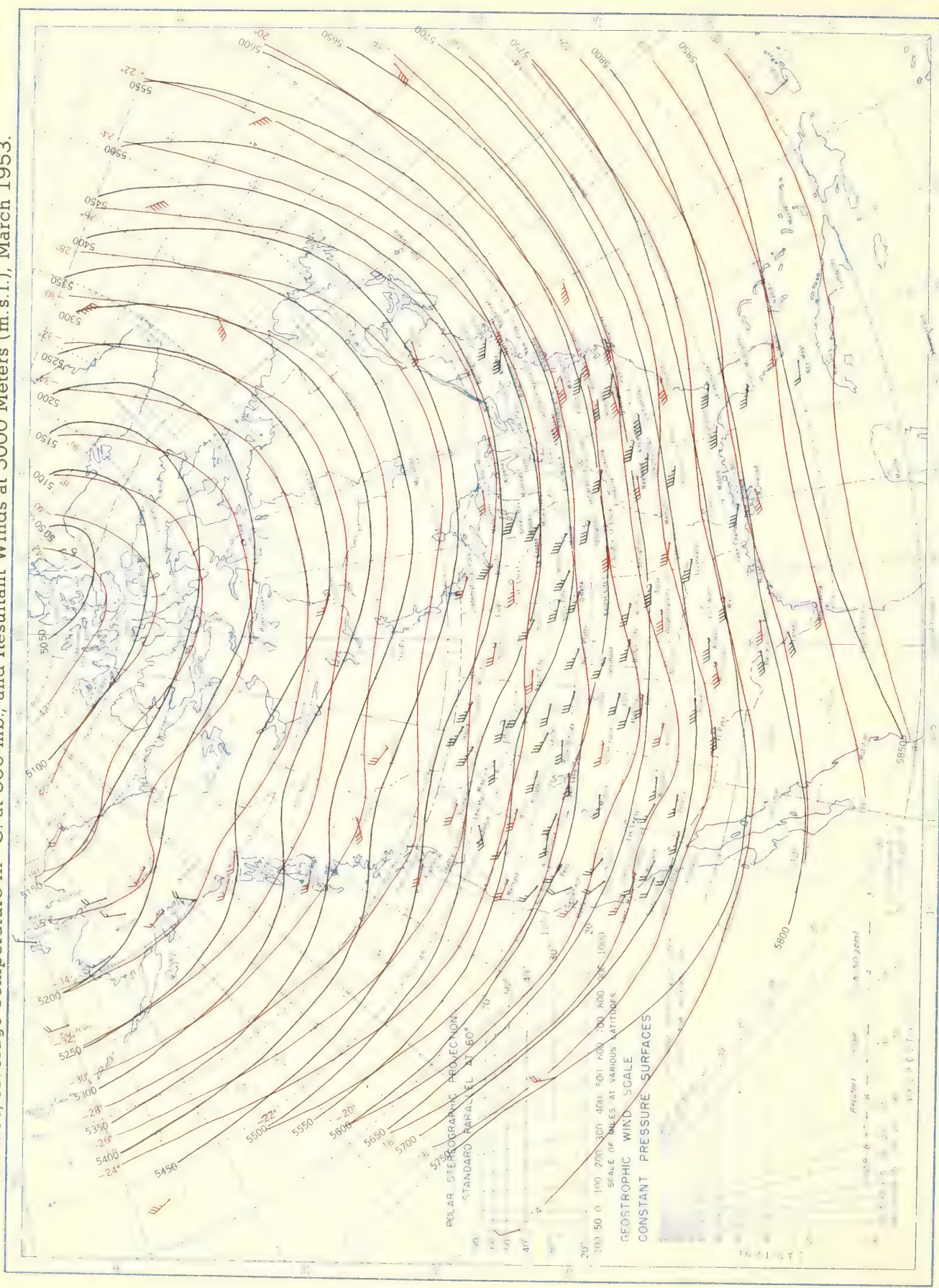
Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), March 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawinsonde observations at 0300 G. M. T.



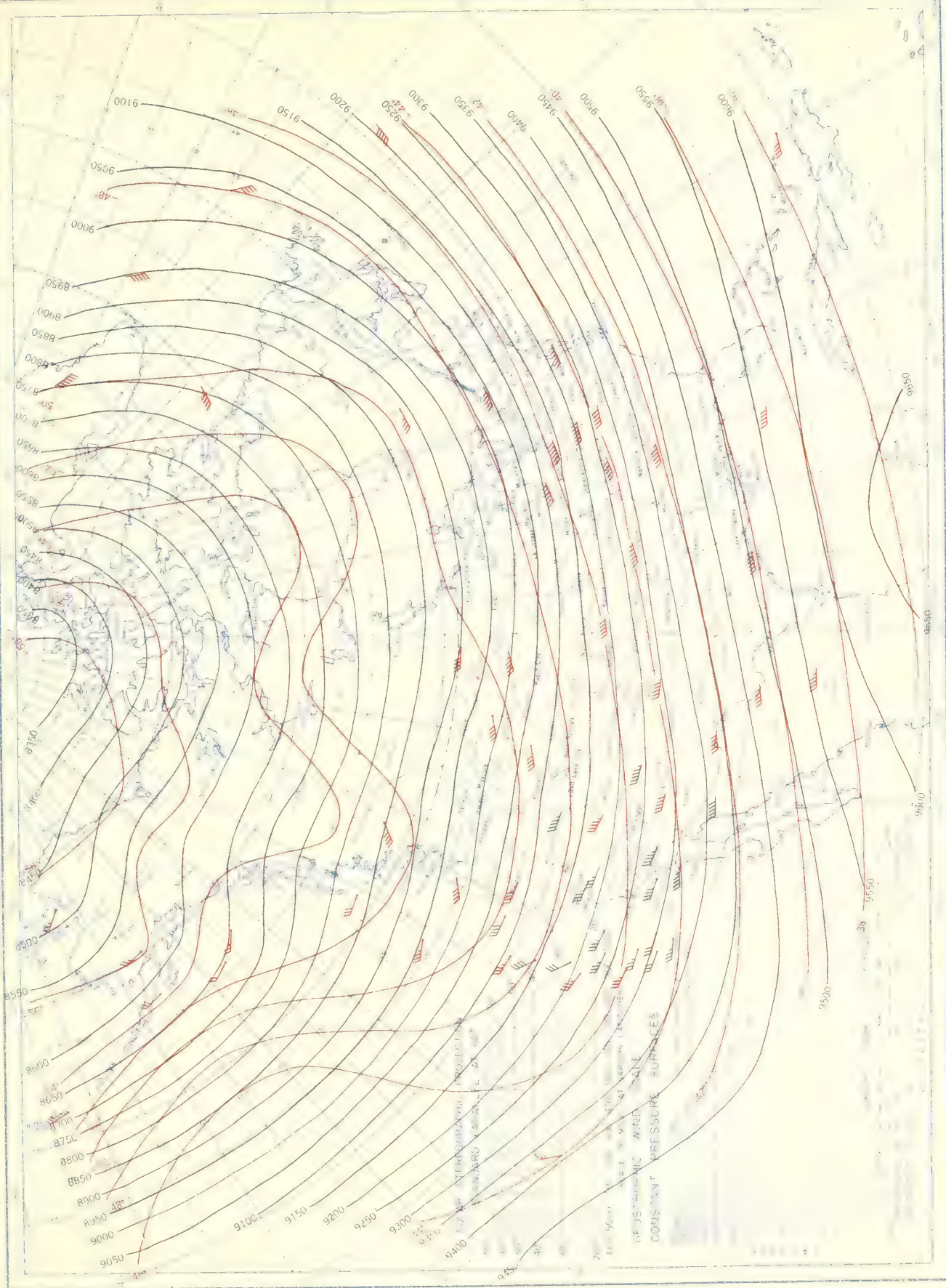
Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), March 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.



Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), March 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G.M.T. Winds shown in black are based on pilot balloon observations at 2100 G.M.T.; those shown in red are based on rawins at 0300 G.M.T.



U. S. Department of Commerce

WEATHER BUREAU

Official Business

Permit No. 1024

C1. [illegible]  
C1. [illegible]  
South [illegible]

CD

Penalty for private  
use to avoid pay-  
ment of postage  
\$300.

U. S. DEPARTMENT OF COMMERCE

SINCLAIR WEEKS, Secretary

WEATHER BUREAU

F. W. REICHELDERFER, Chief

AMERICAN METEOROLOGICAL SOCIETY  
LIBRARY  
1953

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

APRIL 1953

Volume 4 No. 4



ASHEVILLE: 1953



## C O N T E N T S

SURFACE DATA	Page
General Summary of Weather Conditions-----	87
Condensed Climatological Data - States-----	89
Climatological Data - Stations-----	90
Heating Degree Days-----	94
Severe Storms-----	95
General Summary of River and Flood Conditions-----	107
Flood Stage Data-----	108
UPPER AIR DATA	
Radiosonde Data-----	109
Pilot Balloon Data-----	112
Rawin Data-----	113
SOLAR RADIATION DATA	
Solar Radiation Intensities-----	114
Blue Hill Data-----	115
Daily Totals and Average Daily Totals by Weeks-----	116
Daily Illumination on a Horizontal Surface-----	118
CHARTS I- XV	

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

SUBSCRIPTION PRICE: Monthly and annual, 15 cents per copy; yearly subscription, including monthly and annual issues, \$1.50. Checks and money orders should be made payable to the "Treasurer of the United States." Remittance and correspondence regarding subscriptions should be sent to "Superintendent of Documents, Government Printing Office, Washington 25, D. C."

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

APRIL 1953

Volume 4 No. 4

### GENERAL SUMMARY OF WEATHER CONDITIONS

April 1953 was an unusually cold and windy month in sharp contrast to the abnormal mildness that prevailed during the preceding four months. It was among the six coldest Aprils since 1893. Widespread freezes on several occasions caused light to locally severe fruit damage in some sections of the far West and in scattered sections of the middle and southern regions east of the Rocky Mountains.

High winds were particularly frequent and set records or near records in the western and southern sections of the Country. These winds caused much soil erosion in the drier portions of the central and lower portions of the Great Plains, sapped surface soils of their scant moisture supply, and caused some damage to tender vegetation. These dust storms were occasionally severe during the second half of the month, particularly in the Southwest on the 17th and 30th. On the 30th the dust reached great heights and was carried far to the eastward, obscuring the sky most of the day at Cincinnati, Ohio where muddy rain fell in the early evening; the base of this dust cloud was 4,000 to 5,000 feet. Evansville, Ind., also reported that dust aloft obscured the sky part of the time on the 30th, and Vicksburg, Miss., reported that dust in the air greatly reduced visibility on the same date.

The Nation-wide precipitation average was considerably above normal, with greatest excesses in regions near the Canadian Border, northern California, and in southern sections eastward from extreme eastern Oklahoma and Texas. The most important deficiencies occurred in Kansas, extreme southern Texas, and western portions of the lower Great Plains where crops, particularly small grains and pastures generally either continued in poor condition or further deteriorated. Somewhat less serious deficiencies occurred in the far Southwest and in the Carolinas. Good rains during the last decade in North Dakota and adjacent sections of Montana broke a rather serious drought in those sections.

Snowfall was much above normal in the central and northern Rocky Mountains, the northern Sierras and lower Cascades, along the Canadian Border from central North Dakota through Upper Michigan, from Oklahoma City, Okla., northeastward through the Ohio Valley, and in the extreme Northeast.

Sunshine was generally below normal in northern sections and above in the South. The greatest deficiencies occurred in and around the southern Great Lakes region where some stations received only slightly more than 50% of their normal April sunshine. Chicago, Ill., reported the cloudiest April on record, and only 59% of normal sunshine.

Thunderstorm activity for April 1953 was above normal from the southern Great Lakes region to the Gulf and eastward to the Atlantic, and also in the Mississippi Valley as far north as southern Wisconsin and in the eastern sections of the lower Great Plains, and near normal elsewhere.

TEMPERATURE.—April temperatures averaged below normal everywhere, except in most sections along

the Atlantic Coast and along the Mexican Border from southern Texas to southeastern Arizona. At several stations in the Midwest and northern Great Plains temperatures for the month averaged 6° or more below normal, and daily averages were below normal on all but a few days. It was the coldest April at Springfield, Mo., since 1907.

Cold weather beginning in the Pacific Northwest on the first moved into all sections west of the Continental Divide by the 12th. All stations in the far West recorded their monthly minima by the 13th, including Taylor Park, Colo., where the lowest temperature (−24°) for the month occurred on the 12th. During this period below-freezing temperatures and frosts damaged fruit in parts of all the far western States except Montana and Wyoming. A record low April temperature of 9° for Winnemucca, Nev., was recorded on the 8th, and 32° for Fresno, Calif., on the 9th. After the middle of the month the weather gradually became warmer in the far West, temperatures averaging about normal for the third week and much above for the remainder of the month.

While unseasonably cold weather prevailed most of the month from the Mississippi Valley to the Rocky Mountains, the lowest temperatures occurred from the 13th to the 20th. For the week ending on the 20th temperatures averaged 12° to 15° below normal in the Ohio and central Mississippi Valleys and northern Great Plains. North Dakota reported the coldest mid-April week on record, with low temperatures in northern and western portions ranging from 0° to 10° on the 17th. The week was also one of the coldest on record in Kansas and Oklahoma. Damage to early crops, particularly fruits, was extensive in the South-Central States. At Vicksburg, Miss., where scattered frosts occurred from the 18th to 21st, ice was observed in some nearby locations. The latest killing frost on record occurred at Meridian, Miss., on the 21st. Birmingham, Ala., reported 31° on the 21st, the latest freeze there since records began in 1896. Little Rock, Ark., reported the coldest April since 1928. This April was the coldest at Oklahoma City since 1928. At Tulsa, Okla., frost occurred from the 13th to 20th with ice in places, and a freeze on the 18th was the latest since 1906.

Late-season low temperature records occurred over widespread areas during the month. Some of these include 6° at Ely, Nev., on the 7th; 31° at Santa Maria, Calif., on the 9th; 9° at Goodland, Kans., on the 12th; 19° at Sioux City, Iowa, on the 18th; 26° at St. Joseph, Mo., on the 20th; and 30° at Augusta, Ga., 28.8° at Chattanooga, Tenn., and 41.2° at Port Arthur, Tex., on the 21st.

Although there were no extended warm periods during April, temperatures reached unusually high seasonal levels in Texas around the 10th, in the central Great Plains on the 21st and 22d, and in Texas from the 22d to the end of the month. The highest temperature of the month, 106, occurred at Rio Grande City, Tex., on the 9th and McCook, Tex., on the 29th. An early season high temperature



## GENERAL SUMMARY OF WEATHER CONDITIONS—Continued

APRIL 1953

record of 95° for Corpus Christi, Tex., occurred on the 15th.

**PRECIPITATION.**—April precipitation was near to above normal east of the Great Plains, and by the end of the month soil moisture was adequate to excessive. Frequent precipitation caused delays in farm work, particularly in the Northeast and lower Mississippi Valley. At Nantucket, Mass., the month's precipitation totaled 8.41 inches (a new April record). In the South-Central States monthly totals ranged up to 12.51 inches in Arkansas, 12.73 in Mississippi, 12.99 in Alabama, 15.55 in Florida, 11.67 in Georgia, and 9.03 inches in Tennessee. Streams were rising rapidly in the Southern States at the end of the month and a few local overflows were reported. Several stations reported rains of record intensity including the following: Evansville, Ind., 1 inch in 15 minutes on 23d; Nantucket, Mass., 4.48 inches in 24 hours on the 7th–8th; Shreveport, La., 7 inches in 24 hours on the 28th–29th; and also on 28th–29th 1.48 inches in 5 minutes, 1.90 in 15 minutes, and 3.18 inches in 30 minutes at New Orleans, La.

In the northern Great Plains and parts of the far West precipitation was also much above normal. On the 26th–27th at San Francisco, Calif., 2.36 inches fell in 24 hours (a new April record). Heavy precipitation in the northern Great Plains on the 24th and 25th broke a prolonged dry period in an area extending from eastern Montana into northern Minnesota. The average rainfall for North Dakota was the greatest for April since 1896.

The most important deficiencies occurred in the far Southwest and lower Great Plains. Pastures and wheat continued in poor condition and in many sections streams and ponds were low or dry.

**SNOWFALL.**—Snowfall was rather frequent and well above normal in most areas where April snowfall is a usual occurrence. In the far West monthly totals ranged up to 68.3 inches in the Sierras, 41 in the lower Cascades, and 75 inches at Summit, Mont., in the northern Rockies. The snowfall for Idaho was over twice the average amount. During a storm over the northern Rockies from the 6th to the 9th, depths of 30 to 40 inches occurred in southwestern Montana, several feet in some mountain areas of northern Utah, and 20 to 30 inches at some Valley stations immediately north of Salt Lake City. As the storm spread over the western Great Plains on the 10th and 11th depths up to 15 inches were reported in northwestern Kansas.

East of the Rockies most of the snow fell from about the 13th through the 21st. In New England on the 13th and 14th general snowfall, that ranged up to 8 inches in Maine and was accompanied by gale winds along the northern Coast, caused many traffic jams, and resulted in the death of 5 per-

sons and injuries to many. A depth of 2.2 inches was measured at Boston, Mass., after the storm, the greatest depth there this late in the spring season during the past 35 years. On the 18th general snowfall over the Midwest was the heaviest in many years at a number of places for so late in the season. An inch at St. Louis, Mo. was the heaviest since 1929; a record late-season fall of 3.4 inches was measured at Cincinnati, Ohio; and 1.8 inches at Evansville, Ind. was the greatest amount for April since 1910. Locally heavy falls of 8 to 12 inches fell in northern New York on the 20th and 21st. On the 24th and 25th heavy snow fell in parts of Wisconsin, Minnesota and North Dakota, the latter State reporting minor damage to buildings in some localities where accumulations exceeded a foot. Heavy falls in the Black Hills of South Dakota on the last day of the month ranged up to 14 inches.

**DESTRUCTIVE STORMS.**—Storms in April were highlighted by two Georgia tornadoes which accounted for more than one-half of the total storm destruction (both life and property) for the month. The first tornado killed 2 persons and injured 198 in Columbus and vicinity on the 18th, the second killed 18 and injured 300 in Warner Robbins and nearby localities on the 30th, and each caused property damage estimated at \$15,000,000.

Other tornadoes during April caused several additional deaths and injuries and property damage of about \$10,000,000. On the same date as the Columbus tornado a series of tornadoes and high winds swept through central portions of Alabama killing 6 persons, injuring 195 and causing property losses of about \$5,000,000. On the 9th, along a tornado path that extended from east-central Illinois across north-central Indiana, 3 persons were killed, 22 injured, and property losses totaled about \$3,500,000. The 65 tornadoes for April 1953 was a greater number than that of any other April since 1915, and the total damage for April exceeded the total for any entire year during that period except 1927 and 1948.

Severe thunderstorms which occurred in the South-Central States at intervals throughout the month also caused several deaths and injuries and property losses amounting to several million dollars. Winter-type storms were unusually destructive for April. The worst of these included a snow storm in southeastern Maine and coastal areas of New Hampshire on the 13th and 14th, with \$250,000 losses; glaze in southeastern Missouri accounted for \$450,000 on the 18th; and glaze, snow and wind caused \$40,000 damage in southwestern, west-central, and northeastern portions of Minnesota on the 2d and 3d.

# CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

APRIL 1953

Section	Temperature								Precipitation							
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes					
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least		
	°F.	°F.		°F.			°F.		In.	In.		In.		In.		
Alabama	61.2	-2.3	Union Springs	90	29	Valley Head	24	21	7.74	+3.21	Auburn 3SW	12.99	Sylvania	3.60		
Arizona	56.6	-1.3	Gila Bend	103	27	Klagetoh	2	11	.50	-.15	Bright Angel RS	2.57	17 Stations	.00		
Arkansas	57.7	-3.9	2 Stations	90	9	Lead Hill	23	19	7.10	+2.16	Athens	12.51	Corning	3.59		
California	55.3	-1.7	do	105	23	Soda Springs	-7	12	2.22	+.52	Blue Canyon WB AP	10.34	8 Stations	.00		
Colorado	41.0	-2.9	Eversoll Ranch	94	27	Taylor Park	-24	12	1.68	-.05	Wolf Creek Pass	6.01	San Luis Lakes 3W	.27		
Connecticut	48.1	+1.7	Kent	78	26	4 Stations	26	14	5.76	+2.02	Woolcott Res.	7.39	Baltic	4.57		
Delaware	53.4	+7	Lewes	86	25	Millboro	27	22	4.43	+.89	Wilmington Porter Res.	5.35	Middletown 2S	3.76		
Florida	70.3	+.4	2 Stations	95	9	Niceville	32	21	6.39	+3.32	St. Leo	15.55	Marathon Vaca Key	.23		
Georgia	62.4	-1.6	Valdosta WB AP	91	9	2 Stations	24	20	5.29	+1.47	Columbus WB AP	11.67	Lincolnton	1.60		
Idaho	42.6	-2.6	Swan Falls PH	87	22	Island Park Dam	-10	11	1.64	+.27	Burke 2NNE	4.50	Blackfoot	.25		
Illinois	49.3	-3.2	3 Stations	88	9	Aurora College	20	19	2.92	-.63	Shawneetown New Town	5.25	Rockport	1.17		
Indiana	48.2	-3.0	W Baden Spgs College	89	25	Wheatfield	18	14	3.26	-.34	Boonville 2E	6.76	Delphi	1.79		
Iowa	43.9	-5.0	Bedford	90	22	Sanborn	12	18	3.13	+.52	Decorah	5.33	Sidney	1.56		
Kansas	51.2	-3.3	Anthony	98	22	Sharon Springs	8	12	1.82	-.73	La Cygne	6.94	Preston 5NW	.18		
Kentucky	53.6	-2.5	Pikeville	94	29	Benham	22	17	3.90	-.05	Taylorville	5.42	Greensburg Hiway 61 Br.	1.89		
Louisiana	65.9	-1.0	Colfax	91	9	2 Stations	31	19	7.88	+3.15	Pollock	15.48	Grand Chenier	1.10		
Maine	43.6	+2.7	Brunswick	71	23	Greenville	18	16	4.65	+1.50	Hiram 2S	5.90	Stratton	3.17		
Maryland	53.6	+1.3	3 Stations	89	25	2 Stations	21	15	3.86	+.35	Perry Point	5.32	Tonoloway	2.23		
Massachusetts	47.2	+1.8	Lexington	75	23	West Cummington	24	22	5.55	+1.96	Nantucket WB AP	8.41	Rockport 1ESE	3.77		
Michigan	40.7	-1.8	3 Stations	76	9	Kenton U.S. Forest	7	20	3.15	+.74	Fayette Sack Bay	5.62	Eagle Harbor	.72		
Minnesota	38.8	-3.5	4 Stations	80	21	Thief River Falls	11	17	3.02	+.97	Spring Grove 1NW	6.20	Indus	.44		
Mississippi	62.3	-2.2	2 Stations	91	8	Ripley	28	21	7.92	+3.02	Vicksburg WB City	12.73	Brooklyn 2SE	4.66		
Missouri	51.6	-3.8	Waynesville 2W	91	22	Black 6NW	15	19	3.82	-.22	Pleasant Hill	8.20	Sullivan 5E	1.45		
Montana	37.7	-5.7	Albion	83	23	Summit	-12	18	1.70	+.56	Summit	5.78	Ovando 7WNW	.09		
Nebraska	44.4	-4.9	2 Stations	93	27	Sidney AP CAA 3S	5	12	3.07	+.69	Mullen 21NW	6.52	Franklin	1.01		
Nevada	47.9	-1.3	Overton	98	27	Inlay	2	10	.60	-.18	Jarbridge	4.76	5 Stations	T		
New Hampshire	43.9	+1.9	Windham	73	23	Fabyan	20	16	4.40	+1.28	Cannon Mtn.	7.35	Bethlehem	2.56		
New Jersey	51.0	+1.1	Lakewood 2ENE	89	25	Layton 3NW	22	22	5.49	+1.86	Macopin Intake	7.28	Cape May 3W	3.05		
New Mexico	52.0	-.7	Jal	94	21	Red River	5	12	.56	-.21	Cloudcroft 1	2.23	2 Stations	.00		
New York	44.1	-2.4	4 Stations	80	25	Speculator	17	3	3.52	+.48	Lackawack	8.26	Geneva	.80		
North Carolina	59.1	+.5	Tryon	91	23	Celo	19	17	2.89	-.59	Hyatt Creek	7.09	Wilkesboro	.69		
North Dakota	36.3	-5.0	Fullerton	83	21	Belcourt Indian Res.	0	17	2.58	+1.16	Fullerton	4.75	Portal	.99		
Ohio	47.5	-2.3	Chesapeake Hunting-ton CAA AP	87	29	Newark Water Works	12	21	2.86	-.38	Cincinnati Ault Park	5.08	Toledo Blade	1.50		
Oklahoma	57.4	-3.1	Waynoka	103	22	Kenton	16	12	4.04	+.51	Fanshawe	13.96	Boise City	.21		
Oregon	45.4	-2.5	Rome	86	25	Fremont	1	1	2.00	-.06	Tidewater	7.95	Paisley	.12		
Pennsylvania	47.5	-1.1	Columbia	87	25	Kane 1NNE	12	19	4.04	+.55	Paupack 2NW	7.21	Erie CAA AP	2.00		
Rhode Island	47.8	+2.0	2 Stations	73	23	2 Stations	30	4	6.19	+2.38	Providence WB City	6.70	Block Island WB AP	5.21		
South Carolina	61.9	-.5	5 Stations	92	24	Caesars Head	25	20	2.03	-1.20	Paris Mt. Fire Tower	4.55	Effingham	.45		
South Dakota	39.6	-6.4	Belle Fourche 2NE	87	23	2 Stations	-5	11	3.57	+1.50	Bryant	5.91	Rumford	1.42		
Tennessee	55.9	-2.8	Newport	91	29	3 Stations	24	17	5.16	+.83	Enville	9.03	Roan Mountain	1.91		
Texas	64.9	-.3	2 Stations	106	10	2 Stations	20	13	2.28	-.22	Hyatt	12.68	6 Stations	.00		
Utah	45.1	-1.9	St. George CAA AP	91	26	Soldier Summit	-5	13	1.38	+.14	High Line City Creek	6.13	Callao	.01		
Vermont	43.3	+1.7	Bennington 2NW	72	25	Somerset	16	18	4.06	+1.10	Searsburg Mt.	7.01	North Field	2.23		
Virginia	55.0	+.4	2 Stations	90	25	Big Meadows	19	20	3.41	+.12	Norfolk WB City	6.52	Byllesby	1.14		
Washington	46.8	-1.8	Wawawai	83	25	Bumping Lake	12	1	2.29	+.13	Snoqualmie Pass	10.03	Republic	.48		
West Virginia	50.5	-1.4	2 Stations	94	30	Spruce Knob	12	20	3.29	-.23	Pickens 1	8.44	Kermit	1.86		
Wisconsin	40.3	-2.6	Kenosha	84	22	Land O'Lakes	8	13	3.72	+1.25	Mellen 2N	6.62	Stanley	1.82		
Wyoming	36.7	-4.2	Whalen Dam	89	28	Lake Yellowstone	-18	11	1.51	-.07	Big Horn	3.66	Rock Springs	.03		
Puerto Rico	75.9	+.9	Juncos	96	12	Garzad Dam (2)	50	28	3.06	-1.12	Guajataca Dam	10.96	Yauco	.28		

° Other dates also.



## CLIMATOLOGICAL DATA

Table 2

APRIL 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation					Wind				No. of days (sunrise to sunset)		Possible sunshine								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction		Fastest mile		Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)		
												Max. 90° F. or above	Min. 32° F. or below						No. of days	No. of days	Snow, Sleet, Hail	Speed				Direction	Direction					Direction	
																																	0.1 inch or more
ALABAMA	Fl.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	%	In.	In.	In.						M. p. h.	M. p. h.			0-3	4-7	8-10	0-10	%			
Anniston	599	-----	1013.3	73	44	58.3	-3.6	86	29	29	21	0	2	47	---	6.01	+1.29	2.49	9	8	0.0	0	6.6	SW	*33	SSE	29	13	7	10	4.6	---	
Birmingham	610	988.8	1013.9	74	48	60.6	-1.3	86	30	31	21	0	1	45	60	4.97	+3.32	2.17	12	8	0	0	11.3	SSE	41	W	12	15	5	10	4.7	---	
Mobile CO	10	-----	-----	75	57	66.2	-1.2	84	30	42	21	0	0	---	---	6.91	+1.86	2.96	11	3	0	0	13.6	---	65	SE	21	11	10	9	5.2	57	
Mobile	211	984.4	1013.9	76	55	65.5	-1.2	84	10	40	20	0	0	56	76	8.12	+3.02	2.25	12	7	0	0	12.5	SSE	---	---	15	6	9	4.7	---		
Montgomery CO	201	-----	-----	74	53	63.4	-2.3	87	30	40	21	0	0	---	---	8.80	+4.17	2.67	11	6	0	0	---	---	---	---	---	---	---	---	---	---	
Montgomery	198	1006.1	1013.7	75	50	62.2	-2.5	87	30	35	21	0	0	52	72	9.29	+4.48	3.16	8	8	0	0	6.8	NW	35	SE	29	16	6	8	4.1	70	
ARIZONA																																	
Flagstaff	6993	782.6	1012.4	58	26	41.9	-2.2	73	25	7	12	0	25	---	---	1.16	-1.10	1.01	4	3	2.5	2	---	---	---	---	10	12	8	5.3	---		
Birmingham CO	1083	-----	-----	81	54	67.9	-3.3	98	26	40	12	3	0	---	---	.02	-.35	.01	2	0	0	0	8.0	---	29	W	28	---	---	---	90	---	
Phoenix	1114	970.9	1009.8	81	53	66.6	-1.5	96	26	39	12	3	0	36	35	.02	-.33	.02	1	0	0	0	7.1	E	*30	SSW	29	18	8	4	3.3	---	
Prescott	5014	843.2	1010.5	67	36	51.4	-1.5	82	25	19	9	0	9	20	33	.82	+0.02	.63	5	3	T	0	12.4	SW	56	SW	27	12	14	4	4.2	89	
Tucson	2558	922.1	1009.8	80	51	65.2	+2.2	94	26	38	12	3	0	27	28	.06	-.26	.05	2	0	0	0	7.8	W	42	NW	28	18	8	4	3.3	89	
Winslow	4880	846.9	1007.5	70	38	54.1	+1.1	84	26	20	9	0	6	17	28	.76	+2.27	.46	5	2	T	0	10.1	WSW	*54	WSW	8	13	12	5	4.3	---	
Yuma	203	1005.1	1010.2	85	55	69.9	-1.8	100	26	43	'9	6	0	34	31	T	-.10	T	0	0	0	0	10.3	W	41	W	30	19	8	3	2.7	97	
ARKANSAS																																	
Fort Smith	458	994.6	1011.5	69	45	57.0	-5.6	86	22	31	13	0	2	44	66	7.35	+2.86	2.50	10	9	T	0	10.1	NE	42	W	23	14	5	11	4.7	68	
Little Rock	257	998.6	1011.9	70	49	59.0	-3.5	87	8	36	19	0	0	46	66	7.28	+2.12	2.35	11	8	0	0	10.8	S	61	SW	24	14	4	12	5.0	66	
Texarkana	361	998.3	1011.8	73	50	61.4	-3.6	84	'8	33	19	0	0	49	68	7.61	+2.31	2.90	10	7	T	0	9.8	S	*65	W	24	11	10	9	4.8	---	
CALIFORNIA																																	
Bakersfield	489	996.6	1014.9	75	48	61.2	-1.8	89	25	35	9	0	0	41	51	.54	-.21	.37	5	0	0	0	6.1	WNW	*32	NNW	19	10	11	9	5.1	---	
Beaumont CO	2589	-----	-----	66	40	52.7	-2.9	82	25	26	11	0	5	---	---	1.75	+0.3	.89	8	0	0	0	---	---	---	---	9	7	14	6.1	---		
Bishop	4108	869.3	1009.1	72	36	54.1	-6	88	23	15	9	0	10	---	---	.15	-.10	.05	6	1	0	0	---	---	---	---	12	9	9	5.1	---		
Blue Canyon	5280	836.4	1013.9	50	34	42.3	-2.8	74	21	19	'8	0	14	---	---	10.34	+5.69	4.17	13	4	48.2	16	---	---	---	---	4	10	16	6.9	---		
Burbank	699	988.5	1014.6	68	47	57.5	-3.0	79	15	38	10	0	0	44	66	1.20	-.01	.54	5	0	0	0	5.1	S	*25	NNW	10	12	5	13	5.5	---	
Eureka CO	43	1015.6	1018.3	84	44	48.8	-1.8	89	26	35	8	0	0	---	---	3.18	+3.30	1.03	14	0	T	0	8.0	---	34	N	6	4	8	18	7.5	41	
Fresno	331	1002.4	1014.2	73	46	59.4	-2.1	89	25	32	9	0	1	42	58	.96	-.00	.95	3	0	0	0	7.3	NW	29	SW	7	11	12	7	4.9	90	
Los Angeles CO	312	-----	-----	67	51	58.7	-2.8	75	15	44	'9	0	0	---	---	.91	-.26	.60	6	1	0	0	6.6	---	30	SW	9	8	13	5.6	66		
Los Angeles	99	1011.2	1014.7	64	51	57.2	-2.0	67	'11	43	11	0	0	47	73	1.78	+8.2	.91	5	0	0	0	7.5	WSW	*40	W	10	11	8	11	5.4	---	
Mt. Shasta	3543	890.3	1014.8	58	33	45.3	-1.4	78	22	18	9	0	15	---	---	1.99	-1.07	1.03	9	0	6.5	1	---	---	---	---	2	13	5	7.0	---		
Oakland	3	1015.9	1016.3	62	47	54.3	-1.3	70	18	39	'7	0	0	46	76	2.55	+1.09	1.53	8	1	0	0	7.9	W	*28	WSW	29	6	11	13	6.3	---	
Red Bluff	341	1001.4	1014.2	71	46	58.5	-1.5	93	21	34	8	1	0	38	53	4.24	+2.45	2.26	10	3	T	0	7.5	SSE	31	SE	29	7	16	6.5	76		
Sacramento	17	1013.5	1016.3	71	44	57.4	-1.8	89	24	32	8	0	1	42	63	2.13	+3.75	1.67	7	0	0	0	9.1	SW	36	W	7	14	7	4	3.3	41	
Sandberg CO	4517	860.1	1013.2	58	39	48.2	-2.3	77	24	23	8	0	8	32	59	1.18	+4.44	.70	5	1	1.6	0	20.2	NNW	---	---	---	---	8	12	10	5.3	---
San Diego	19	1012.2	1015.3	65	53	58.9	-1.6	70	12	44	9	0	0	49	70	.33	-.50	.20	7	0	0	0	7.1	SW	22	SW	27	7	13	10	6.0	54	
San Francisco CO	52	-----	-----	58	47	52.7	-3.0	70	18	42	'7	0	0	---	---	3.42	+1.93	2.36	7	0	0	0	9.6	---	30	W	18	6	10	14	6.5	64	
San Francisco	1	1014.9	1016.3	60	45	52.5	-1.6	70	18	38	'9	0	0	45	79	1.66	+3.37	1.09	8	0	T	0	13.4	WNW	*40	WNW	5	4	17	9	6.2	---	
Santa Catalina	1568	957.7	1014.6	58	46	51.9	-4.3	71	15	40	8	0	0	---	---	1.44	+5.1	.64	7	0	0	0	---	---	---	---	9	7	14	6.3	---		
Santa Maria	231	1007.5	1016.2	63	42	52.7	-3.1	70	'1	31	9	0	2	45	78	1.15	-.05	.84	5	0	0	0	7.1	W	*24	W	8	11	10	9	5.2	---	
COLORADO																																	
Alamosa	7534	765.3	1010.8	56	22	39.4	-2.3	70	'21	6	12	0	28	---	---	.35	-.19	.12	6	0	2.9	T	---	---	---	---	11	12	7	4.9	---		
Colorado Springs	6175	804.9	1011.4	55	29	41.9	-4.6	78	27	15	12	0	20	22	54	1.58	+1.8	.55	13	3	11.5	3	12.9	NNW	*43	NNW	2	7	10	13	6.3	---	
Denver	5221	832.0	1010.2	55	31	42.8	-4.7	82	27	8	18	0	18	24	57	1.29	-.76	.64	13	1	12.0	7	8.2	NE	34	NW	14	8	16	6.6	58		
Grand Junction	4849	854.4	1008.9	61	38	49.3	-2.5	83	22	25	11	0	9	24	43	.71	-.04	.25	7	2	2.6	2	9.4	ESE	*43	SW	27	7	14	6.6	53		
Pueblo	4799	851.0	1009.6	64	33	48.5	-1.3	87	27	17	12	0	16	26	52	.96	-.28	.50	9	0	5.3	3	8.8	WNW	45	SW	30	8	9	13	5.7	78	
CONNECTICUT																																	
Bridgeport	7	1008.5	1009.3	58	42	49.7	+3.4	76	23	35	'15	0																					



## CLIMATOLOGICAL DATA

APRIL 1953

Table 2--Continued

[illegible]

See footnotes at end of table.



## CLIMATOLOGICAL DATA

Table 2—Continued

APRIL 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation										Wind			No. of days		Possible sunshine			
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max. 90° F. or above Min. 32° F. or below	Average dew point	Total	Departure from normal	Greatest in 24 hours	No. of days 0.1 inch or more	With thunderstorms	Snow, Sleet, Hail	Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy		Sky cover, tenths (sunrise to sunset)		
ft.	mb.	mb.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	%	in.	in.	in.	0.1 inch or more		in.	in.	M.	M.										
NEVADA (Cont.)																																
Reno	4397	859.1	1013.5	62	29	45.4	-2.3	83	22	13	7	0	21	25	49	0.41	-0.05	0.21	4	0	3.0	2	8.5	WNW	46	NW	30	9	13	8	5.7	68
Winnemucca	4299	864.5	1013.3	61	26	43.4	-3.4	81	21	9	8	0	22	23	47	0.30	-1.53	0.15	7	1	1.0	1	8.3	---	35	NW	27	4	14	12	6.6	69
NEW HAMPSHIRE																																
Concord	339	997.6	1007.9	56	34	45.0	+2.0	69	23	26	16	0	12	34	6P	4.27	+1.19	1.16	15	2	1.5	1	7.7	NW	40	NW	14	4	6	20	7.5	35
Mt. Washington	6262	794.9	1004.4	28	18	23.0	+1.0	40	26	6	18	0	29	---	93	7.41	+1.54	2.31	21	0	43.6	31	34.5	NW	*130	NW	23	1	7	22	8.4	35
NEW JERSEY																																
Atlantic City CO	8	1007.8	1009.8	58	46	51.5	+2.1	70	23	34	20	0	0	---	---	3.92	+0.52	1.88	14	2	0	0	16.5	---	48	SE	16	5	9	16	6.8	50
Newark	11	1008.1	1009.4	59	44	51.4	+1.4	77	26	34	20	0	0	37	62	6.07	+2.80	1.87	13	1	0	0	11.2	WNW	*35	NW	14	3	13	14	7.1	---
Trenton CO	56	1002.4	1009.1	60	44	52.0	+1.3	85	25	34	20	0	0	---	---	5.67	+2.67	1.11	11	1	0	0	10.4	---	38	NW	14	2	11	17	7.3	53
NEW MEXICO																																
Albuquerque	5310	843.6	1006.7	69	41	55.1	-1.4	82	21	28	13	0	4	19	30	0.69	+1.16	0.62	3	1	0	0	11.4	WNW	50	W	17	18	6	6	3.9	73
Clayton	4969	841.5	1008.1	64	32	48.2	-2.8	85	27	15	12	0	15	---	---	1.5	-0.98	0.06	3	0	0	0	---	---	---	---	---	---	---	---	---	---
Raton	6379	798.5	1007.5	62	28	44.8	-2.1	78	27	15	18	0	21	---	---	3.6	-0.72	0.30	7	0	0	0	---	---	---	---	---	---	---	---	---	---
Roswell	3612	887.2	1007.4	76	43	59.6	-1.1	90	21	28	12	2	2	21	27	0.72	-0.03	0.67	3	0	0	0	16.4	---	75	W	29	18	10	2	3.2	---
NEW YORK																																
Albany	277	1005.1	1008.6	56	37	46.7	+1.6	76	26	27	22	0	4	35	68	4.71	+2.10	1.26	15	2	3	0	9.8	---	49	NW	23	2	8	20	7.9	38
Bear Mountain	1300	---	---	52	39	45.5	-0.8	72	26	29	20	0	5	---	---	4.72	+0.97	1.80	16	2	0	0	8.8	---	---	---	---	---	---	---	---	---
Binghamton	1601	949.5	1008.8	50	34	41.8	-0.8	74	26	24	20	0	14	32	72	3.44	+0.20	0.83	18	5	4.0	0	12.4	WNW	42	NW	14	0	7	23	8.5	34
Buffalo	693	981.4	1009.8	53	35	44.0	+0.2	68	30	28	19	0	11	34	73	2.24	-0.31	0.53	15	1	2.8	0	15.7	SW	54	SW	10	2	6	22	8.0	36
New York CO	10	997.6	1009.8	57	45	50.9	+1.1	74	26	34	21	0	0	---	---	5.99	+2.77	1.89	13	1	0	0	14.7	---	57	NW	14	3	13	14	7.0	49
New York	19	1007.8	1009.3	60	45	52.3	+2.2	76	26	35	20	0	0	37	61	6.06	+2.96	2.03	14	1	0	0	12.6	WNW	55	NW	14	2	14	14	7.1	---
Rochester	543	989.8	1009.5	53	36	44.6	+1.1	67	25	28	19	0	10	35	73	1.50	+1.14	0.29	15	1	2.1	0	12.3	---	50	SW	10	4	8	18	7.4	48
Schenectady	217	---	---	56	40	47.8	+2.7	76	26	33	20	0	0	---	---	3.85	+1.80	1.00	17	0	0	0	---	---	---	---	---	---	---	---	---	---
Syracuse	399	987.5	1009.7	54	37	45.7	-0.3	76	26	30	19	0	8	35	68	2.07	-1.05	0.42	14	3	0	0	11.1	---	45	NW	23	3	6	21	8.0	45
NORTH CAROLINA																																
Asheville CO	2203	---	---	66	43	54.4	-1.1	84	24	30	17	0	4	---	---	2.79	-0.07	1.90	10	1	0	0	10.8	---	29	SE	3	10	11	9	5.1	72
Asheville	2093	938.7	1012.3	66	43	54.4	-1.1	84	24	30	17	0	4	---	---	2.79	-0.07	1.90	10	1	0	0	10.8	---	29	SE	3	10	11	9	5.1	72
Charlotte	753	984.4	1012.0	72	47	59.5	-2.2	88	24	32	21	0	1	44	60	2.55	-0.62	0.99	9	5	0	0	8.6	---	31	SW	18	10	13	7	4.8	78
Greensboro	891	980.4	1012.3	70	44	57.1	-0.4	84	10	29	17	0	5	42	60	3.07	-0.28	1.25	10	4	0	0	9.6	---	42	WNW	30	11	11	8	5.2	66
Hatteras	4	1011.5	1012.3	67	55	61.0	+1.4	76	30	44	21	0	0	52	72	4.96	+1.88	1.82	8	5	0	0	15.3	SSW	43	SE	12	10	8	4.6	67	
Raleigh CO	400	---	---	73	48	60.5	+0.8	86	10	32	20	0	1	---	---	4.43	+0.21	1.41	10	7	0	0	7.9	---	---	---	---	---	---	---	---	---
Raleigh	438	996.3	1011.9	72	47	59.4	+0.9	86	10	31	21	0	2	45	62	4.57	+1.04	1.69	9	7	0	0	9.9	---	---	---	---	---	---	---	---	---
Wilmington	30	1011.2	1012.8	74	52	62.6	+4.4	84	1	35	21	0	0	52	70	2.81	+1.10	1.81	7	2	0	0	12.2	SSW	35	S	30	15	8	7	4.0	69
Winston-Salem	967	976.0	1011.6	69	46	57.8	+0.3	83	10	32	17	0	2	40	56	3.57	+1.17	1.25	11	4	0	0	10.2	SSW	*30	WSW	12	14	8	8	4.7	---
NORTH DAKOTA																																
Bismarck	1650	953.6	1014.8	48	27	37.2	-6.1	79	21	10	16	0	24	26	69	2.44	+1.05	1.02	10	0	2.9	1	13.9	E	50	E	23	5	4	21	7.8	40
Devils Lake CO	1471	960.4	1013.7	47	28	35.7	-4.3	73	21	8	17	0	26	---	---	2.31	+0.87	1.58	10	0	4.9	2	10.8	---	35	NW	22	4	10	16	7.3	59
Fargo	895	978.3	1013.7	47	28	37.5	-4.6	73	21	9	17	0	22	27	67	2.31	+0.87	1.58	11	11	0	0	14.3	NNW	46	NW	16	2	8	20	7.9	44
Williston CO	1877	946.8	1015.8	45	27	36.0	-6.9	71	21	9	16	0	21	23	63	2.01	+0.94	0.79	8	1	1.4	0	8.4	---	33	W	15	4	7	19	7.7	55
OHIO																																
Akron	1210	972.9	1010.9	53	35	44.0	-3.1	75	9	24	18	0	13	35	74	2.75	-0.45	0.80	20	4	3.7	2	11.8	WNW	---	---	---	3	5	22	7.9	---
Cincinnati Obs.	761	---	---	60	42	50.8	-2.8	82	9	27	19	0	4	---	---	2.95	-0.69	0.97	16	3	3.4	3	8.7	---	37	---	---	---	---	---	---	---
Cincinnati	871	978.7	1011.1	59	40	49.2	-2.9	80	9	26	19	0	5	37	67	2.66	-0.93	0.76	17	4	3.3	2	13.1	WNW	---	---	---	4	7	19	7.4	---
Cleveland CO	683	---	---	53	39	45.9	-1.1	77	30	32	20	0	3	---	---	2.38	-0.53	0.57	19	0	0	0	---	---	---	---	---	---	---	---	---	---
Cleveland	787	983.1	1010.2	54	37	45.5	-1.8	77	9	26	8	0	7	35	72	2.82	+0.09	0.46	22	5	4.3	2	11.0	WSW	49	SW	10	3	4	23	8.0	37
Columbus CO	724	---	---	56	41	48.2	-3.2	77	9	27																						



## CLIMATOLOGICAL DATA

Table 2-Continued

APRIL 1953

State and station	Elevation (ground)	Pressure			Temperature										Precipitation										Wind				No of days (sunrise to sunset)		Possible sunshine					
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal					No. of days		Average dew point	Average relative humidity	Total	Departure from normal			No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		Clear	Partly cloudy	Cloudy		Sky cover: tenths (sunrise to sunset)				
							Highest	Date	Lowest	Date	Max. 90° F or above	Min. 32° F or below	Departure from normal				Greatest in 24 hours	0.1 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction			Speed	Direction						Date	Clear	Partly cloudy	Cloudy
Fl.	Mb.	Mb.	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	In.	In.	In.	0.1 inch or more	With thunderstorms	Total	In.	In.	M	M	M	M	0-3	4-7	8-10	0-10	%						
SOUTH DAKOTA (Cont.)																																				
Rapid City	3165	897.4	1013.5	48	28	38.4	-6.1	81	23	16	18	0	23	26	66	2.77	+0.76	1.01	14	1	8.6	2	12.4	NNW	43	NNW	24	3	10	17	7.4	37				
Sioux Falls	1420	959.7	1012.0	51	30	40.5	-5.9	82	21	14	18	0	18	27	64	5.23	+2.88	2.64	12	1	2.9	2	13.8	NNW	42	NNW	15	4	7	19	7.7	4				
TENNESSEE																																				
Bristol	1519	958.0	1012.2	65	42	53.6	-2.4	86	24	29	17	0	4	41	65	2.82	-1.43	.73	13	5	.2	T	6.5	W	*30	WSW	30	9	12	6.2	—					
Chattanooga	670	985.4	1012.8	71	44	57.5	-2.2	85	24	29	21	0	2	43	63	4.75	+2.22	2.39	8	6	.0	0	8.0	SSW	40	S	15	10	11	7	4.6	81				
Knoxville	949	977.3	1012.6	68	45	56.2	-2.8	85	24	31	21	0	1	42	62	4.23	+5.59	1.13	10	4	.0	T	11.4	WSW	62	SW	30	9	9	12	5.5	54				
Memphis CO	271	—	—	—	68	50	58.6	-3.6	84	8	35	19	0	—	—	5.67	+9.7	2.36	9	—	.0	0	—	—	—	—	—	—	—	—	—	—				
Memphis	263	997.3	1012.3	69	49	58.7	-3.1	85	9	33	19	0	0	45	64	7.41	+2.61	3.29	9	7	.0	0	13.2	S	40	S	18	11	8	11	5.2	70				
Nashville	577	992.6	1012.4	68	45	56.5	-3.2	84	29	31	19	0	1	44	66	4.53	+8.84	2.32	9	7	.0	0	8.7	NNW	38	W	15	9	10	12	5.7	57				
Oak Ridge	905	979.0	—	—	68	44	55.7	-2.2	85	29	29	17	0	3	—	3.35	-.73	1.23	9	5	.0	T	6.2	—	—	—	11	9	10	5.2	—	—				
TEXAS																																				
Abilene	1752	948.5	1009.2	78	50	63.7	-1.8	93	17	35	19	2	0	38	45	1.89	-.58	.94	4	5	.0	T	15.1	SSE	50	SW	17	17	8	5	3.3	75				
Amarillo	3590	883.2	1008.1	70	39	54.6	-1.0	90	21	24	18	2	7	29	45	.62	-.83	.59	4	3	.0	T	14.4	S	50	NE	2	12	11	7	4.6	81				
Austin	615	989.8	1011.6	79	54	66.4	-1.5	91	9	38	19	2	0	53	67	4.69	+7.73	2.60	9	7	.0	T	10.8	S	31	N	25	11	10	9	5.1	63				
Big Spring	2569	921.4	1008.5	78	49	63.6	-.6	91	17	35	19	2	0	35	39	1.80	+1.15	1.00	4	4	.0	T	16.0	S	—	—	16	9	5	3.7	—	—				
Brownsville	16	1006.8	1009.4	87	68	77.3	+3.6	100	18	55	20	12	0	65	73	.68	-.88	.68	1	1	.0	0	15.0	SSE	40	S	28	7	14	6	2	62				
Corpus Christi	40	1009.1	1010.2	85	64	74.1	+3.1	100	30	49	19	8	0	62	73	.30	-1.44	.27	3	3	.0	0	14.3	SSE	43	S	28	4	14	12	6.5	67				
Dallas	487	992.6	1011.2	75	51	62.6	-3.7	89	8	34	19	0	0	50	67	5.03	+1.16	2.61	5	3	.0	T	12.8	S	40	S	14	12	9	5	1	65				
Del Rio	1091	974.9	1008.8	87	60	73.2	-2.1	98	25	46	19	13	0	43	41	.7	-1.45	.35	2	0	.0	0	17.2	ESE	39	W	29	12	10	8	4	3	76			
El Paso	3920	876.4	1007.2	76	53	64.4	+1.3	88	26	40	13	0	0	26	25	.71	-.44	.55	4	1	.0	0	16.7	NNW	56	NNW	29	20	6	4	2	80				
Fort Worth	688	987.5	1011.1	74	51	62.4	-3.2	87	11	36	13	0	0	47	61	4.82	+1.01	2.35	6	4	.0	T	15.0	SSE	40	NNW	18	13	9	8	4.6	—				
Galveston CO	7	—	—	75	64	69.5	+6.2	92	30	48	19	1	0	—	—	.93	-2.16	.54	5	—	.0	0	13.5	—	36	NE	19	—	—	—	—	54				
Galveston	5	1010.8	1011.8	76	64	69.9	+6.2	91	30	49	19	1	0	63	79	.37	-3.03	.16	5	1	.0	0	12.7	SSE	—	—	—	4	13	13	6.8	—				
Houston CO	41	1006.1	—	79	60	69.3	-2.2	90	30	45	13	1	0	—	—	2.30	-1.10	1.22	8	6	.0	0	11.5	—	40	SE	29	6	7	17	6.6	62				
Houston	50	1008.5	1011.5	79	58	68.7	+3.2	92	30	44	13	1	0	57	71	1.27	-1.82	.53	3	3	.0	0	13.7	SSE	—	—	—	4	13	13	6.8	—				
Laredo	500	993.6	1008.6	91	66	78.7	+2.8	104	30	51	19	16	0	57	55	.51	-1.10	.51	1	2	.0	0	14.4	SE	*35	W	29	8	11	11	5.8	—				
Lubbock	3243	897.4	1008.0	74	42	58.2	-1.3	89	22	29	18	0	1	33	44	.62	-.49	.35	2	0	.0	0	17.2	S	50	W	28	15	12	3	4	6				
Port Arthur	16	1010.8	1011.9	79	58	68.3	+4.4	90	30	41	20	1	0	59	77	.96	-.98	1.52	7	3	.0	T	12.1	SSE	44	S	28	7	10	13	6.1	59				
San Antonio	1903	942.8	1009.3	80	52	66.0	-1.4	91	17	40	12	2	0	39	42	.94	-1.25	.79	3	3	.0	T	12.6	S	*43	NE	11	16	9	5	3.2	—				
San Antonio	782	985.8	1010.3	81	58	69.2	+4.4	96	30	42	13	4	0	52	61	2.08	-.94	.89	7	5	.0	T	10.4	SE	57	W	29	9	11	10	5.7	60				
Victoria	109	1005.8	1010.6	81	60	70.4	-2.2	95	30	44	13	3	0	58	68	2.15	-.29	1.92	6	5	.0	0	10.3	—	58	NNW	12	6	10	14	6.4	—				
Waco	504	991.9	1010.7	77	52	64.6	-2.6	90	9	38	20	2	0	50	65	2.04	-1.93	1.68	7	6	.0	T	11.8	S	—	—	11	11	8	5.1	—	—				
Wichita Falls	1027	973.2	1009.9	73	48	60.9	-1.7	92	22	36	20	1	0	40	52	1.80	-.55	1.10	2	4	.0	T	12.7	S	*40	W	29	15	11	4	3.9	—				
UTAH																																				
Milford	5028	841.5	1011.0	62	30	46.2	-1.6	80	26	15	7	0	21	—	—	1.02	+2.6	.86	3	4	1.3	T	—	—	—	—	8	7	15	6.3	—	—				
Salt Lake City	4222	862.9	1011.2	57	35	46.4	-3.7	83	26	24	9	0	11	29	56	2.77	+1.01	.89	12	1	5.3	T	3.9	SE	34	NNW	30	8	7	15	6.5	59				
VERMONT																																				
Burlington	331	993.2	1008.1	52	36	43.9	+1.6	63	4	26	18	0	9	34	71	3.51	+8.8	.98	16	1	4.6	2	9.1	N	34	S	16	3	6	21	8.2	32				
VIRGINIA																																				
Cape Henry CO	16	1009.8	1010.5	66	51	58.2	+2.1	87	25	38	21	0	0	—	—	5.88	+2.75	2.23	14	4	.0	0	13.8	—	42	NNW	13	5	13	8	5.3	67				
Lynchburg	947	977.3	1011.3	67	44	55.5	-.0	82	10	30	21	0	3	39	57	3.26	+1.3	.99	10	3	.0	T	9.9	SSW	31	SW	15	5	11	14	6.4	65				
Norfolk CO	11	1008.1	1011.5	69	51	59.8	+1.9	86	25	38	20	0	0	—	—	6.52	+3.36	3.00	14	4	.0	T	11.4	—	34	W	13	—	—	—	—	73				
Norfolk	25	1010.5	1011.5	69	49	58.7	+2.4	86	25	38	20	0	0	45	64	5.80	+2.64	2.40	14	4	.0	T	11.5	S	—	—	—	11	11	5.8	—	—				
Richmond CO	162	—	—	70	47	58.2	+1.4	85	25	33	15	0	0	—	—	3.55	+2.8	1.79	10	—	.4	T	—	—	—	—	6	9	15	—	—	—				
Richmond	160	1005.1	1011.1	71	45	58.0	+1.9	87	25	31	15	0	2	42	62	3.16	-.07	1.54	10	4	.2	T	9.5	W	26	SW	14	5	10	15	6.7	62				
Roanoke	1174	968.8	1011.1	66	44	55.2	-.3	82	24	30	22	0	2	38	55	2.69	-.26	.89	8	3	.0	T	11.4	NNW	—	—	5	13	12	6.6	—	—				
Washington CO	72	—	—	65	47	56.0	+1.3	88	25	34	20	0	0	—	—	4.18	+9.8	1.24	13	3	.0	T	8.7	—	39	NNW	26	4	9	17	7.3	42				
Wash. Nat'l. AP	14	1006.4	1010.6	66	47	56.1	+1.7	88	25	33	20	0	0	40	58	4.77	+1.71	1.62	11	3	.0	T	10.6	NNW	38	NNW	26	4	9	17	7.3	42				
WASHINGTON																																				
Ellensburg	1727	951.2	1014.3	56	34	45.1	-3.1	69	19	19	2	0	13	32	63	1.39	+9.7	.63	9	0	.0	T	14.7	NW	*50	NNW	5	2	11	17	7.6	—				
Kelso	17	—	—	58	38	48.0	-1.9	73	19	30	2	0	5	—	—	2.83	+2.27	.59	22	0	.0	T	—	—	—	—	0	4	26	9.1	—	—				
North Bend CO	194	—	—	53	43	48.0	-.6	62	2	34	1	0	0	—	—	3.22	-.20	.62	22	1	.0	T	13.6	—	48	NNW	5	4	8	18	7.5	36				
Olympia	190	1008.1	1015.5	57	36	46.8	-1.6	70	19	26	2	0	7	38	73	2.58	+2.24	.66	17	1	.0	T	6.2	SSW	*22	SW	12	0	8	22	8.7	—				
Seattle CO	14	—	—	57	44	50.3	-1.5	66	19	37	1	0	0	—	—	1.61	-.33	.39	14	0	.0	T	9.2	—	36	SW	11	1	7	22	8.3	27				



# HEATING DEGREE DAYS

(Base 65°F.)

APRIL 1953

Table 3

State and station	Current season			Long term mean July through this month	State and station	Current season			Long term mean July through this month	State and station	Current season			Long term mean July through this month				
	This month	Period July through this month	Long term mean July through this month			This month	Period July through this month	Long term mean July through this month			This month	Period July through this month	Long term mean July through this month					
ALABAMA					INDIANA					NEVADA					SOUTH DAKOTA			
Birmingham	173	2602	2518		Evansville	376	4242	4332		Elko	679	6095			Huron	728	7339	7599
Mobile (CO)	61	1472	1534		Ft. Wayne	581	5750	5978		Ely	749	6626			Pierre	726	7016	6993
Mobile	69	1535			Indianapolis (CO)	479	4785	5282		Las Vegas	102	2323			Rapid City	792	6349	6797
Montgomery (CO)	95	1882	2042		Indianapolis	516	5153			Reno	579	5224	5276		Sioux Falls	725	7323	
Montgomery	120	2123	2061		South Bend	612	5898			Tonah	518							
					Terre Haute	471	4991			Winnemucca	644	5621	5954					
ARIZONA					IOWA					NEW HAMPSHIRE					TENNESSEE			
Flagstaff	683	6392	6545		Burlington	546	5720	5697		Concord	593	6355	6967		Bristol	343	4057	
Phoenix (CO)	39	1281	1418		Charles City (CO)	701	7074	7307		Mt. Washington	1252	11778			Chattanooga	237	3238	3157
Phoenix	49	1501			Davenport (CO)	559	5746	6049							Knoxville	274	3426	3561
Prescott	403	4027			Des Moines	366	6190	6226		NEW JERSEY					Memphis	215	3023	3087
Tucson	64	1647			Dubuque	659	6816	6675		Atlantic city (CO)	396	4003	4770		Nashville	282	3418	3553
Winslow	325	4435			Keokuk (CO)	484	5148			Newark	405	4515	5309		TEXAS			
Yuma	19	840	1035		Sioux City	634	6764	6747		Trenton (CO)	394	4418	4950		Abilene	102	2214	2567
ARKANSAS					KANSAS					NEW MEXICO					Amarillo	319	3771	4098
Ft. Smith	255	3309	3183		Concordia (CO)	486	5062	5256		Albuquerque	298	4082	4348		Austin	60	1519	1678
Little Rock	213	2889	2992		Dodge City	441	4614	4924		Albuquerque	495	4813	4816		Big Spring	97	2271	2618
Texarkana	137	2408			Goodland	644	5788	5473		Raton	597	5896			Brownsville	3	442	627
					Topeka (CO)	443	4685	4983		Roswell	171	3228	3526		Corpus Christi	8	774	970
CALIFORNIA					Wichita	403	4318	4552							Dallas	124	2149	2362
Bakersfield	149	2039	2161		Topeka	463	4889			NEW YORK					Del Rio	13	1240	1497
Beaumont (CO)	365	2697			KENTUCKY					Albany	544	6038	6407		El Paso	69	2346	2517
Bishop	333	3887	4165		Lexington	425	4333	4630		Bear Mountain (CO)	577	5816			Ft. Worth	127	2069	2333
Blue Canyon	675	4835			Louisville (CO)	338	3859	4286		Binghamton	675	6300	6480		Galveston (CO)	27	1011	1169
Burbank	221	1602			Louisville	366	4094			Buffalo	625	5831	6531		Galveston	25	1047	
Eureka (CO)	480	4077	4067		Pikeville (CO)	269	3466			New York (CO)	417	4330	5078		Houston (CO)	30	1134	
Fresno	185	2394	2357		LOUISIANA					La Guardia Field	377	4168			Houston	33	1230	1326
Los Angeles (CO)	180	1206	1378		Baton Rouge	54	1457	1505		Rochester	603	5797	6382		Laredo	4	718	
Los Angeles	227	1513			Lake Charles	40	1337			Schenectady	511	5795			Lubbock	212	3296	
Mt. Shasta (CO)	586	4997			New Orleans (CO)	28	1001	1220		Syracuse	573	5816	6516		Port Arthur	38	1348	
Oakland	234	2556	2771		New Orleans	32	1113								San Angelo	68	1925	
Red Bluff	225	2402	2572		Int. Airport, Moisant	41	1237			Asheville (CO)	318	3883	3946		San Antonio	36	1378	1442
Sacramento (CO)	203	2252	2576		Shreveport	89	2054	2122		Asheville	353	4203			Victoria	30	1059	
Sacramento	226	2480			MAINE					Charlotte	191	2992	3212		Waco	89	1873	
Sandberg (CO)	500	3855			Caribou	747	8495			Greensboro	252	3575	3789		Wichita Falls	173	2591	
San Diego	172	1228	1515		Eastport (CO)	636	6570	7552		Hatteras	135	2149	2478		UTAH			
San Francisco (CO)	364	2765	2726		Greenville (CO)	766	8211	8777		Raleigh (CO)	178	2897	3234		Milford	557	5550	
San Francisco	367	2905	2983		Portland	620	6390	6865		Raleigh	207	3161			Salt Lake City (CO)	507	4577	5282
San Jose	256	2147			MARYLAND					Wilmington	125	2236	2380		Salt Lake City	551	4974	5761
Santa Catalina	387	2057			Baltimore (CO)	311	3695	4338		Winston-Salem	231	3308		VERMONT				
Santa Maria	366	2618			Baltimore	327	4189							Burlington	627	6604	7455	
					Frederick	422	4829			NORTH DAKOTA				VIRGINIA				
COLORADO					MASSACHUSETTS					Bismarck	826	7970	8562		Cape Henry (CO)	228	2935	3415
Alamosa	760	8001			Boston	475	4966	5625		Devils Lake (CO)	871	8762	9685		Lynchburg	228	3820	3920
Colorado Springs	687	5851			Milton	574	5690			Fargo	819	8386	8911		Norfolk (CO)	179	2719	3297
Denver	660	5410	5486		Nantucket	572	5003	5366		Grand Forks	822	8731	9389		Norfolk	212	3048	
Grand Junction	466	5251	5462		Pittsfield	635	6591			Peabina	792	8747			Richmond (CO)	222	3392	3795
Pueblo	489	5107	5322		MICHIGAN					Williston (CO)	861	7893	8836		Richmond	234	3609	
CONNECTICUT					Boston	475	4966	5625		OHIO					Roanoke	303	3845	4039
Bridgeport	454	4831			Milton	574	5690			Akron	624	5780	5953		WASHINGTON			
Hartford	467	5240	5825		Nantucket	572	5003	5366		Cincinnati (CO)	366	4051	4750		Ellensburg	591	6645	
New Haven	488	5063	5612		Pittsfield	635	6591			Cleveland (CO)	469	4721			Kelso	504	4401	
					MICHIGAN					Cleveland	567	5000	5836		North Head (CO)	509	4353	4513
DELAWARE					Alpena (CO)	776	6905	7629		Cleveland	581	5315			Olympia	541	4777	
Wilmington	377	4448			Detroit	607	5658	6306		Columbus	500	5058	5285		Seattle (CO)	434	3711	4118
DIST. OF COLUMBIA					Escanaba (CO)	793	7409	8102		Dayton	531	5186	5299		Seattle	538	4645	
Washington (CO)	276	3726	4393		Grand Rapids (CO)	615	5880	6382		Sandusky (CO)	573	5146	5821		Spokane	574	5522	5984
Washington	275	3805			Grand Rapids	658	6250			Toledo	608	5643	6017		Tacoma (CO)	488	4143	4555
					Lansing	663	6298	6768		Youngstown	627	5758			Tatoosh Island (CO)	534	4853	5112
FLORIDA					Marquette (CO)	859	7447	8035							Walla Walla (CO)	386	3903	4689
Apalachicola (CO)	43	1130	1215		Muskegon	681	6286			OKLAHOMA					Yakima	500	5046	5399
Daytona Beach	28	757			Sault Ste. Marie	841	7880	8579		Oklahoma City (CO)	284	3300	3590		WEST VIRGINIA			
Fort Myers	1	289	284		Ypsilanti	616	5794			Oklahoma City	285	3373			Charleston	373	4070	
Jacksonville (CO)	29	911	1123		MINNESOTA					Tulsa	301	3445			Elkins	514	5386	5502
Jacksonville	40	1083			Duluth (CO)	867	8675	8926							Huntington (CO)	359	3788	
Key West (CO)	0	40	46		Duluth	897	8855			OREGON					Parkersburg (CO)	411	4374	4778
Key West	0	56			International Falls	879	9125			Burns (CO)	649	5915			Petersburg	405	4485	
Melbourne	15	481			Minneapolis	715	7514	7667		Eugene	456	4151			WISCONSIN			
Miami (CO)	0	151	181		Rochester	760	7735			Meacham	785	6319			Green Bay	707	7461	7513
Int. Airport, Hialeah	0	108			St. Cloud	767	8226	8419		Medford	410	4162	4354		La Crosse	679	7082	
Miami Beach	0	91			St. Paul	690	7404	7664		Pendleton	463	4428			Madison (CO)	664	6610	7078
Orlando	16	585			MISSISSIPPI					Portland (CO)	394	3488	4012		Madison	654	6553	
Pensacola (CO)	61	1275	1425		Jackson	112	2093	2154		Portland	445	3895			Madison (CO)	664	6610	
Tallahassee	65	1302			Meridian	126	2265	2204		Roseburg	443	3984	3958		Madison	651	6757	
Tampa	11	525	550		Vicksburg (CO)	99	1908	2044		Salem	467	4149			Milwaukee (CO)	651	6127	6711
West Palm Beach	1																	

## SEVERE STORMS

Table 4

APRIL 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Pittsburgh, Pa.	1	Daytime				3			Electri- cal	Lightning struck home in Braddock Hills, ripped hole in roof, and slightly burned 3 occupants.
Prosper and Frisco, Collin County, Tex.	2	P.m.							Hail and wind	Window panes in homes, churches, and schools broken. Chimneys and tree limbs torn down. Stones as large as hen eggs. Storm lasted about 20 minutes. Wheat crops and gardens damaged.
Bowie, Mon- tagne Coun- ty, Tex.	2	P.m.							Wind	Granary building on ranch destroyed and swept away. Many roofs taken off and small buildings destroyed. Fruit trees uprooted.
Lindsay (6 miles north- west of), Garvin Coun- ty, Okla.	2	9:58- 10:12 p.m.			0	0	\$ 0	\$ 0	Tornado	Path northeasterly. Did not destroy any property.
Minnesota, southwest- ern, west- central, and north- eastern counties	2-3	P.m. and a.m.					40,000		Ice (glaze), sleet, snow, and wind	Many poles and wires down. Communication and elec- tric power services seriously disrupted. Some damage to trees. Traffic somewhat delayed. Snow- fall heavy in some localities. Damage to overhead wire-systems mostly in Willmar area and caused mainly by heavy, moist snow that clung to wires and froze and strong winds that followed.
Wiggins, Stone County, Miss.	4	3:03 p.m.	100		0	0	15,000	5,000	Tornado	Hit north section of Wiggins and lasted about 3 min- utes. Wind velocity estimated up to 120 m.p.h. Several homes and other buildings damaged; trees up to 24 inches in diameter uprooted and twisted off.
Memphis, Hall Coun- ty, Tex.	4	10:30 p.m.	*5				50,000		Wind, hail and electrical	Damage mostly to compress sheds, windmills, and roofs.
Rivercamp Community, Childress County, Tex.	4	P.m.				1			Wind and hail	Trees uprooted; fences blown down; water tanks scattered; porch blown off.
Ft. Smith, Ark.	5	7:40-7:45 a.m.							Electri- cal	Considerable damage to commercial building and church by fire caused by lightning.
Bessemer, Jefferson County, Ala.	6	3:45 p.m.	35	2	0	12	10,000		Tornado	2 buildings destroyed, a few others damaged. Storm moved east-northeastward.
Panama City, Fla.	6				0	0		0	do	Shattered 45 feet of concrete block wall at baseball park. Tornado apparently dipped to earth only short distance at ballpark as only other evidence of strong winds were some broken tree limbs.
Wyoming, southeast- ern portion	7	Evening							Snow	Heavy snow blocked roads.
Prescott vicinity, Ariz.	8	2-6 a.m.					2,500		Wind	High winds blew section of house (under construction) on top of parked auto. Felling trees also did some property damage. Winds predominantly from southwest.
Anderson County, Kans.	8	Early a.m.					1,000		Electri- cal	Lightning produced a fire which burned barn to ground near Garnett.
Linn County, Kans.	8	4 a.m.					1,500		do	Fire from lightning strike destroyed barn and hay and killed 1 cow, southeast of Pleasanton.
Jefferson City, Mo.	8	5:25 a.m.					140,000		Hail	Heavy damage to roofs, windows, green-houses, and neon signs. Largest stones about 1-3/4 inches in diameter.
Mt. Washing- ton, Ky.	8	7:30 p.m.					1,000		Wind	Wind blew utility building and shed off foundation.
Rockville, Ind.	8	P.m.					1,300		Hail	Hail "nearly as large as golf balls" caused damage to green-houses and composition roofs.
Leon in Ma- son County eastward through Jackson, Roane, Cal- houn and Gilmer Counties to vicinity of Glen- ville, W. Va.	9	1:45-2:35 p.m.	*1-6	65			3,100	Consider- able	Hail and winds	Hail damaged window glass, building roofs, early lettuce and cabbage crops. High winds in Glenville area caused airplane to break loose from its moor- ings, resulting in damage to wing and undercarriage, and blew over silo on farm 3 miles southwest of Glenville.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

APRIL 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Troy, Pike County, Ala.	9	3:45 p.m.	*2	5			\$10,000		Thunder- storm	Minor damage to approximately 90 buildings; several barns blown over. Storm moved northeastward. Winds estimated to be 70 m.p.h.
Logan Coun- ty, Ill.	9	4:15 p.m.	30	6	0	3	30,000		Tornado	Struck Logan County fairgrounds at west end of Lin- coln, then moved northeastward through rural areas. Buildings on 6 farms north and northeast of Lincoln damaged. Tornado funnel apparently lifted a few miles northeast of Lincoln. Funnel observed aloft in McLean County.
Chicago area, Ill.	9	5 p.m.					10,000		Hail	Heavy hail damaged roofs and windows in some subur- ban areas of Chicago. Heaviest damage reported at Harvey.
Champaign and Ver- milion Counties, Ill.	9	5:15 p.m.	150 (tor- nado) *1-2 (wind)	38	1	10	2,500,000	\$ 0	Tornado, hail, and wind	Tornado began near Leverett, in Champaign County, and moved east-northeastward across Vermilion County in- to Indiana, crossing State line about 6 p.m. Heavy damage in rural areas and at several small communi- ties. Collision, Jamesburg, and Bismarck areas in Vermilion County hard hit. Hail at many points along storm's path. 8 homes reported destroyed and 72 damaged; large number of other structures hit. Little damage to field crops, but considerable losses in stored crops and livestock. Tornado losses estimated \$2,250,000 and wind \$250,000.
Downs area, McLean County, Ill.	9	Late af- ternoon					1,000		Hail	Roof and window damaged.
Aurora- Geneva area, Ill.	9	Late af- ternoon					10,000		Hail and wind	Hail damaged green-houses and roofs; wind downed trees and TV antennae. Hail damage, \$5,000; wind, \$5,000.
Marshall, DeKalb, Etowah, and Jefferson Counties, Ala.	9	5:30 p.m.					5,000		do	Near Gadsden hail reported size of hen eggs. Near Boaz some fields completely covered with hail. Storm moved southeastward.
Lansing area, Mich.	9	6:50 p.m.					20,000		Thunder- storm	Winds up to 90 m.p.h. in gusts destroyed or damaged 13 airplanes at Davis Airport and several at Capital City Airport. Winds blew down trees, broke windows, and knocked down a couple of barns. Electrical service interrupted in some localities.
Leesburg (east of), Lee County, Ga.	9	7 p.m.		Sev- er- al			500	Slight	Wind	Rural section. Storm moved east-southeastward, hit- ting two points, 1½ miles apart. No important damages, except machinery shed picked up and tossed over fence distance of 40 yards.
Fountain to Delaware Counties, Ind.	9	7-9:15 p.m.	200- 1,300	106	2	12	1,000,000	0	Tornado and hail	Tornado moved eastward across Indiana with some short portions of path in a northeast-southwest direction. Path practically in same line as tornadoes which oc- curred earlier on same date at Lincoln and Urbana, Ill. Path was distinctly traceable from the air just south of Attica to about 10 miles northeast of Muncie. Storm demolished or severely damaged 150 buildings, killing 2 persons at Albany and injuring a dozen others; picked up auto carrying it 400 feet and demolishing it. First wire failures at Attica occurred about 7 p.m. and at Muncie about 9 to 9:15 p.m., indicating that tornado moved a total of 106 miles in about 2 hours and 15 minutes, or at rate of about 47 m.p.h. Hail occurred in connection with tornado and variously described by some observers as "size of walnuts or small lemons".
Oak Forest and Belmont, Caldwell and Gonzales Counties, Tex.	9	8 p.m.	*2 to 3	6 to 8					Wind and hail	Extensive damage to growing crops of corn and water- melons.
Piggott, Ark.	9	8 p.m.							do	Hail, ranging from marble size to 1 inch in diameter, covered ground to 1 inch with drifts to 3 inches. Considerable damage to windows, roofs, fruit trees, and gardens.
Detroit area, Mich.	9	9:15 p.m.					30,000		Thunder- storm	Winds up to 55 m.p.h. uprooted trees and blew in windows in Oak Park, Royal Oak, and Ferndale. Hail size of a quarter fell in Livonia. Winds demol- ished a home in Warren Township.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

APRIL 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Aracoma in Logan County, near Logan, and from Williamson to Logan, W. Va.	10	5:30 a.m.					\$20,000		Wind and electrical	500-foot conveyor belt line shed at Snap Creek Coal Company at Aracoma wrecked and blown onto nearby residence, causing estimated damage of \$20,000. Telephone lines blown down between Logan and Williamson, causing disruption of service for about an hour. Medium-sized trees blown down in Logan area.
Baltimore and vicinity, Md.	10	Morning					3,000		Electrical	Church steeple damaged at Reistertown by lightning (\$1,500). Another bolt ripped layer of brick from Towson Home (\$1,000), and a third strike hit chimney (\$500).
Madison County, Fla.	10	Afternoon						Considerable	Hail	Heavy hail in southwest portion of County caused considerable crop damage. Light hail in town of Madison.
Glenn Burnie and Fort Geo. G. Meade, Md.	10	5-6 p.m.				1	1,000		do	Hailstones broke considerable number of windows, damaged roofs, ripped automobile convertible tops, damaged metal siding of automobile trailers, dented numerous cars. One soldier had arms bruised by hail.
Glen St. Mary, Fla.	10								do	Some damage to nursery stock.
Monticello, Fla.	10	5:30-6 p.m.						Light	do	
Sampala Lake, Madison County, Fla.	10								Electrical	Lightning destroyed barn and contents including 900 bushels of corn and 18 tons of hay.
Columbia County, Fla.	10								Wind	Damaged several tobacco barns and 2 automobiles.
Dilley, Frio County, Tex.	10	9:30 p.m.	*10	16					Wind and hail	Damage slight to severe, mostly to watermelons and fruit trees.
Marquette, Mich.	10	P.m.					1,000		Sleet, wind, and snow	City was isolated for a short time when communication lines knocked out of commission.
Menominee, Mich.	10								Wind	Wind and waves tore up concrete and beach walk. Communications interrupted.
Carter County, Ky.	10						6,000		do	4 barns blown down, with almost total destruction.
Magoffin County, Ky.	10						5,000		do	Wind uprooted several trees, blew several television antennae down, blew some barns down, and took roofs off of some houses.
Greenville and northern portion of Hunt County, Tex.	11	6:30 p.m.	*1½	30			215,000	\$50,000	Hail	Severe hailstorm with stones reported as large as tennis balls. Damage to homes, green-houses, gardens, crops, and automobiles.
Longview, Gregg County, Tex.	11	10:15 p.m.	*1				Several thousands		do	Large hailstones fell, some bigger than hen eggs. All crops damaged; house roofs beat off and windows broken.
Bradley County, Ark.	11	P.m.							do	Hail size of marbles. Most severe in Gravel Ridge, Prospect, and Blue Springs areas. Extensive crop damage.
Ada (east of), Pontotoc County, Okla.	12	3:15 a.m.						500	do	Hail, size of golf balls, covered much of eastern part of County.
Hartselle, Morgan County, Ala.	12	3:30 a.m.					1,000		Thunderstorm	Minor damage to several buildings; trees blown down.
Garden City (12 miles south of), Blount County, Ala.	12	3:40 a.m.	100	½	0	0	3,200		Tornado	In rural area, destroyed 1 building and damaged 2 others. Storm moved northeastward.
Talladega, Ala.	12	4:45 a.m.	*1	2			3,000		Thunderstorm	Minor damage to homes and other buildings; hundreds of trees blown down. Moved northeastward.
Youngstown (near Panama City), Fla.	12	Early morning			0	0			0 Tornado	1 small building demolished; railroad station moved onto track; roof damage to several homes; and several pine trees downed - some uprooted, others twisted off.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

APRIL 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Saint Leo, Fla.	12-13								Rain	10.97 inches in 24-hour period. Weighing gage indicated 9.80 inches in 6-hour period ending at 11:30 p.m. on 12th.
Birmingham, Ala.	12	5 p.m.			2				Electrical	2 youths killed by lightning during thunderstorm while seeking refuge under a tree.
Smith County, Miss.	12	P.m.					\$5,000	\$1,000	Wind	7 homes and 1 outbuilding damaged.
Ridge Springs, S. C.	13	4 a.m.						400,000	Hail	Between 700 and 800 acres of peaches ruined.
Columbus County, N.C.	13	6 a.m.						12,000	do	6 square miles damaged in Tatums Township.
Ft. Pierce, Fla.	13	8:45 a.m.	Narrow		0	0		0	Tornado	Storm struck 3-1/4 miles south of Ft. Pierce where 1 home suffered considerable damage. Storm lifted and struck again about 2 miles to east, removing roofs of 2 garages.
New England	13-14	Late evening of 13th and morning of 14th			5	Many	250,000	Light	Snow (wet) and wind	Effects of storm further aggravated by its "surprise", late-season occurrence, and because highway maintenance departments were caught unprepared. Heaviest damage resulted from downed telephone and power poles, with resultant disruption of services in many communities. In this respect, southeastern Maine and coastal New Hampshire hardest hit. Several serious traffic jams developed in eastern Massachusetts on hills of well-traveled highways and more than a thousand motorists stranded for as long as 15 hours. Snowcover deposited by storm was of short duration and was gone in most places on 15th.
Clay County, Miss.	14	2:30 p.m.			0	0	7,000	1,000	Tornado	Reported 10 miles northwest of West Point, moving northeastward. Several buildings damaged.
Stone County, Miss.	14-20							50,000	Cold and wind	Cold and winds damaged crops; heaviest to melons.
Blaine, Kingfisher, Canadian, Grady, McClain, and Cleveland Counties, Okla.	14	5-7:55 p.m.	*1 to 10	85	1		700,000	800,000	Hail	Extensive damage by hail to roofs, windows, automobiles, and other property in Calumet, El Reno, Mustang, Yukon, Norman, and Tuttle. Damage in El Reno estimated at \$300,000; in Yukon, \$50,000. Crop damage, mostly in Canadian County to wheat and other fall-sown crops. Storm moved southeastward at rate of about 20 m.p.h.
Wanette and vicinity, southern part of Pottawatomie and northern Pontotoc Counties, Okla.	14	5:30 p.m.						3,000	do	Damage to corn crop, just coming up; also to gardens.
Haywood County, Tenn.	14	6:30 p.m.	200	1/2	0	8	30,000	0	Tornado	2 homes destroyed and 3 damaged. 7 farm buildings destroyed and 14 damaged. About 20 families affected.
Henderson County, Tenn.	14	6:45 p.m.	300	1	0	1	40,000	0	do	2 homes destroyed and 20 damaged. 8 farm buildings destroyed and 15 damaged. 29 families affected.
Madison County, Tenn.	14	6:45 p.m.	300	1 1/2	0	2	55,000	0	do	4 homes destroyed and 5 damaged. 12 farm buildings destroyed and 5 damaged. 10 families affected.
Canadian and Grady Counties, Okla.	14	6:50-7:30 p.m.	440	13	0	0	300,000	0	do	Path to southeast curving to east-southeast from a point 5 miles southwest of Yukon to 8 miles east of Tuttle. Tornado damage to 8 or more farms. It occurred in the hailstorm listed above that includes these 2 counties.
Weakley County, Tenn.	14	7 p.m.	150	1/2	0	1	10,000	0	do	5 homes damaged. 3 farm buildings destroyed and 8 damaged. 5 families affected.
Atoka (southwest of), Atoka County, Okla.	14	11 p.m.	25	1/4	0	0	1,000	0	do	School building unroofed and windows blown out.
Mena, Ark.	14	11 p.m.							Hail	Considerable damage to gardens, flowers, and shrubs.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

APRIL 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
El Dorado, Ark.	15	1:45 a.m.					\$6,000		Electrical and hail	2 houses destroyed by fire resulting from lightning. Some light hail, but no hail damage.
Nebraska, eastern half	15	All day				1	20,000	Light	Wind	Widespread damage, but not severe in any one locality. Peak speeds of 75 to 90 m.p.h. at several stations. Damage consisted of windows blown out, roofs damaged, 3 moored light aircraft overturned, and trees or large limbs blown over wires, a house, and automobile.
Iowa	15	All day			1	10			Wind and snow	Numerous traffic accidents in blinding snow in western Iowa; 8 persons seriously injured, many more with minor injuries. Buses and trucks blown off highways into ditches. Snowfall of 2 to 3 inches in northwest. Strong winds across State broke power and telephone lines, plate-glass windows, and blew over trees. 2 persons injured by falls caused by high winds; 1 died 2 days later.
Kansas, eastern half	15	During day							Wind	Winds which had been moderately strong over western Kansas late on 14th behind a low pressure center reached central Kansas about midnight of 14th-15th and by 3 a.m. had extended across State, increasing in speed in eastern areas. By 5 or 6 p.m. speeds averaged 30 to 45 m.p.h., with gusts of 50 to 65 m.p.h. Numerous instances of minor damage occurred to small aircraft, plate glass windows, roofs, TV antennae, power lines, and small buildings. Some blowing dust reported, particularly from Cloud to Riley County.
Festus, Mo.	15	Afternoon					1,000		do	Damage to roofs, windows, trees, signs, and television antenna.
Springfield, Mo.	15	Afternoon				2	5,000		do	Same type light damage as above. Man injured when blown off ladder; another cut by flying glass when a large window was blown out. Wind gusts reached 66 m.p.h.
Sullivan, Mo.	15	Afternoon					500		do	Wall of drive-in theatre blown out. Other light damage.
St. Louis, Mo.	15	Afternoon					10,000		do	Light damage to roofs, windows, trees, etc. Wind gusts reached 86 m.p.h. at Lambert-St. Louis Airport.
Lindale-Mt. Holly area, Clermont County, Ohio	15	6-6:15 p.m.	33	2	0	0	8,000	\$630	Tornado	3 points of damage. On Highway 132 at point of origin chicken house overturned before storm took on tornado characteristics 300 feet to northeast. On Concord Road it dipped down to destroy 2 garages, damage farm machinery, and shift a residence on its foundation. On Highway 222 garage destroyed, along with several apple trees and several hives of bees. Tornado hedge-hopped in northeastward direction.
Franklin County, Ky.	15	P.m.					50,000		Wind and hail	Greatest damage to buildings and automobiles; many buildings unroofed. 90 percent of damage caused by wind, 10 percent by hail.
Scott County, Ky.	15	P.m.					5,000		Wind	Several small buildings and a barn blown down.
Jefferson County, Ky.	15						3,000		do	Power lines broken by falling trees and branches. A 30-foot section of metal cornice blown from building.
Jefferson County, Ind.	15	P.m.					1,500		do	Several barns and 1 small house damaged.
Indianapolis, Ind.	15	11 p.m.					50,000		do	Gusts to 50 m.p.h. or more twisted steel hangar in process of construction. Damage caused by fact that sufficient bracing had not yet been added to structure so it was unable to withstand winds not normally destructive.
Beaufort and Pitt Counties, N. C.	16	Noon	100	2	0	0	8,000	5,000	Tornado and hail	Tornado struck near Grimesland, Pitt County. Hail at scattered localities over both Counties. Hail as much as 1 inch in diameter reported near tornado. Small airplane and 4 tobacco barns demolished. Most crop damage to tobacco. Some damage to electric lines.
Kansas, southeast- ern portion	17	Evening							Snow, sleet, and ice (glaze)	Sleet and heavy glaze, extremely unusual so late in season, fell behind a cold front from Coffey County south and southeastward into Oklahoma and Missouri. Much fruit (in blossom stage or later) killed; trees and shrubs damaged; local power service disrupted when limbs weighted with ice fell onto wires; and numerous accidents on icy streets and pavements occurred.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

APRIL 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Kay, Pawnee, Creek, Tul- sa, Osage, Rogers, and Washington Counties, Okla.	17-18	6:30 p.m. -8 a.m.					\$1,070,000	\$90,000	Hail, wind, snow, rain, sleet, ice (glaze), and elec- trical	Several hauled out areas including strip running east and west just north of Ponca City with perhaps worst crop damage in western Kay County in area around Nardin. Extensive damage by hail in and near Tulsa to window glass, car paint, roofs, aircraft, and aircraft hangars; an estimated 6,000 to 10,000 insurance claims, totaling over \$1,000,000. Losses by snow and freezing rain include more than 100 cattle recently moved into Washington County from south Texas for summer pastures. Much freeze damage to corn, gardens, and fruit crops. Damage to property by hail \$1,000,000; by wind \$60,000; by snow, sleet, and glaze \$10,000; to crops by hail \$50,000, by snow, sleet, and glaze \$40,000.
Between Dover and Omega, Kingfisher County, Okla.	17	9:30-9:40 p.m.	1,320	6-7				10,000	Hail	Hail covered ground. Damage to wheat.
Cherokee County, Okla.	17	11:30 p.m.					2,000		Wind	Damage to stockade at old Ft. Gibson.
Sallisaw and Badger-Lee communities, Sequoyah County, Okla.	17-18	11:55 p.m. -12:05 a.m.	*10	10			10,000		do	American Red Cross reports 15 homes and 30 other buildings damaged.
Sebastian County, Ark.	18	12:20 a.m.					525,000	75,000	Hail and wind	Hail and high wind covered an extensive area in Sebastian County from Fort Smith eastward to Lavaca. Ball park in Fort Smith almost totally destroyed, together with widespread damage to roofs, windows, automobiles, etc. in City. Damage to roofs in rural areas. Fruit trees and crops suffered considerable damage. Hailstones averaged size of golf balls, with some as large as baseballs reported.
Crittenden, Cross, Independence, Jackson, Poinsett, and White Counties, Ark.	18	3:30-6 a.m.			2	41	1,403,000	90,000	do	Widespread wind- and hailstorms covered 6-county area of northeastern Arkansas. Principal damage due to wind, although heavy hail occurred in several localities in storm area. 2 persons killed in Poinsett County. Estimated property damage by counties was: Crittenden \$225,000, Cross \$300,000, Independence \$21,000, Jackson \$270,000, Poinsett \$580,000, and White \$7,000. Due to early season, crop damage comparatively slight. Crops principally affected were strawberries, winter grains, truck, and gardens.
Missouri, west-central, southwest, and south-central portions	18	Early morning			1		50,000	400,000	Sleet and ice (glaze)	Sleet and freezing rain caused damage to telephone and electric lines, buildings, and automobiles. Nearly all damage by falling trees and limbs of trees overloaded with ice. Some outages of electricity lasted for 24 to 36 hours. Fruit and berries badly damaged over wide area, although low temperatures alone would have done much of damage. Home gardens and truck farms damaged badly. Small grain which had reached jointing stage damaged to some extent. Boy electrocuted when he came in contact with a fallen "live" wire in Springfield.
Lilbourn, Mo.	18	5:30 a.m.			1		6,000		Electrical	Woman died in fire caused by lightning, which destroyed her farm home.
Pennsylvania, western portion	18	Daytime			1				Snow and glaze (ice)	One fatal accident on Pennsylvania Turnpike from slippery highway.
Pickens, Tuscaloosa, Jefferson, Shelby, Talladega, Coosa, Tallapoosa, Chilton, and Lee Counties, Ala.	18	1-5 p.m.	* $\frac{1}{2}$ to $1\frac{1}{2}$	190	6	195	5,000,000		Tornadoes and thunderstorms	Storms formed ahead of cold front moving across State. General path of storms was east-southeastward. Most intense damage in Shelby and Lee Counties. About 200 homes and 300 other buildings demolished. About 1,500 houses and other buildings damaged. Over 1,500 families affected by storm.
Columbus, Ga.	18	6:15 p.m.	400		2	198	15,000,000	0	Tornado	Came from Alabama, moving east-southeastward. Violent winds, as great as 100 to 150 m.p.h. for 4 to 6 minutes, caused very great destruction in north Columbus from Bealwood to Edgewood sections, including 499 homes destroyed and 2,200 damaged (1,648 heavily damaged); 100 other buildings destroyed and 362 damaged; 2,800 families affected. Very large number of trees and utility lines blown down, blocking streets, knocking out electric services and more than 10,000 telephones. Numerous automobiles and other property smashed by falling trees.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

APRIL 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Montezuma, Macon County, Ga.	18	6:30 p.m.			0	1	\$75,000	Slight	Tornado	Storm moved eastward, destroying 3 homes and 8 other buildings and damaging 73 homes and 8 other buildings, including a metal hangar that was lifted from its foundations and carried some distance across Montezuma Airport; 75 families affected.
Buena Vista, Marion County, Ga.	18	6:45-7 p.m.	400 to 1,000		0	2	150,000	\$10,000	do	Storm moved eastward, destroying 10 homes and 40 other buildings and damaging 25 homes and 20 other buildings; 50 families affected. Many trees and utility lines blown down, knocking out services; considerable damage to timber. Considerable crops in storage, mostly cotton seed, destroyed.
Tyrrell County, N.C.	19	5 a.m.					100	1,200	Hail	Scattered damage in 1 square mile in Alligator Township.
Lauderdale County, Tenn.	22	6 p.m.	100	3/4	0	0	10,000	0	Tornado	11 homes and farm buildings damaged. 13 families affected.
Roscoe, No- lan County, Tex.	22	9 p.m.	*14				°5,000	°	Hail and electrical	Several houses unroofed; many trees broken; wheat blown down.
Wyoming, northeast- ern portion	23-24	Noon 23d- Sundown- 24th						Moderate	Wind	Considerable damage to growing crops, especially wheat.
Bryant (1 mile west of), Okmul- gee County, Okla.	23	3:31-4:10 p.m.	300	1½	1	4	7,000	0	Tornado	School bus overturned several times. Several buildings on dairy barn completely demolished. Moved eastward to Okfuskee County line tearing up 25 telephone poles.
San Antonio, Tex.	23	4 p.m.	2 to 300	3			°200,000	°	Hail and wind	Scattered hail fell throughout city. High winds struck small area 3 miles north of airport. Trees uprooted; chicken houses demolished. Most damage from hail to windows, neon signs, greenhouses, automobiles, and power lines.
Clifton, Bosque Coun- ty, Tex.	23	4 p.m.							Hail	Windshields broken.
San Marcos, Hays Coun- ty, Tex.	23								Wind and hail	Strong winds unroofed Radio Station KCNY and a few other small buildings.
Atoka and vicinity, Atoka Coun- ty, Okla.	23	4:10-5 p.m.					10,000		Rain	Flooded many homes and several families had to be evacuated. 3.82 inches of rain fell between 4:10 and 5 p.m. at Atoka.
Wagoner and southwest of, Wagoner County, Okla.	23	5:35 p.m.					10,000		Wind and electrical	Considered straight winds, although some unverified claims received that tornado funnel was sighted. Fairly widespread area. 120 claims for wind damage to roofs and windows; some small homes lost roofs or porches.
Alma, Craw- ford County, Ark.	23	7 p.m.	830		0	0	10,000	0	Tornado	Many buildings, including a new brick structure destroyed. Funnel cloud observed by many.
LeFlore, Lat- imer, and Pushmataha Counties from Clay- ton east to Arkansas State line, Okla.	23	7:15-11 p.m.					9,000		Rain	\$7,000 loss (included in total) to cattle caught by rising streams. \$2,000 loss to automobiles. About 4½ inches of rain fell in Talihina area. Creeks and streams were at extremely high levels.
Idabel, Mc- Curtain County, Okla.	23	8 p.m.	200	1	0	1	100,000	0	Tornado	Path east-northeastward. 11 buildings damaged or destroyed. Although reported by several as straight winds, the description of damage over narrow, well-defined path, confirms reports by others that this was a tornado.
Mt. Zion community, 1 mile east and 4½ miles south of Valliant, McCurtain County, Okla.	23	8:10 p.m.	Nar- row		0	0	2,000	0	do	Length of path to northeast not known, but was clearly evident through timber. 1 home destroyed and 3 others damaged; roof of school damaged.
Eagletown, McCurtain County, Okla.	23	8:30 p.m.	17	3/4	1	14	25,000	0	do	Path northeastward. American Red Cross reported 1 person killed and 14 injured, 3 homes destroyed and 6 damaged.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

APRIL 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Lavaca, Jackson, Colorado, DeWitt, Fayette, and Gonzales Counties, Tex.	24	1-2 a.m.	*50 to 60	60 to 100			\$75,000	\$25,000	Hail and wind	Winds estimated 60 to 100 m.p.h. Heavy damage to young tomatoes. 600 street lights replaced in Yoakum. Many small sheds upset; roofs blown off; some large barns demolished; water cooling tower demolished.
Texarkana, Ark.	24	4 a.m.	100	1	0	0	5,000	0	Tornado	Considerable damage to houses, trees, and automobiles in college section of City. Path of storm progressed northeastward. Indications are that storm dipped to, or almost to, ground at points along its path.
Hope, Ark.	24	4:15 a.m.			0	0	800	1,200	Hail and wind	Storm reported to have covered an area within a 5 to 6 mile radius of Hope Experiment Station. Hailstones ranging from $\frac{1}{2}$ to $1\frac{1}{2}$ inches in diameter reported. Principal damage to crops, including tomatoes, sweetpotatoes, peaches, and oats. A few roofs damaged by hail and wind.
Jefferson County, Ky.	24	A.m.					500		Electrical	Lightning struck building, dislodging bricks and masonry. Lightning also smashed windows in another building.
Kingman, McPherson, Saline, and Ottawa Counties, Kans.	24	10 a.m. to shortly after noon			0	0	0	0	Tornadoes	In connection with vigorous squall line, 6 funnel clouds sighted aloft in a south-southwest to north-northeast line across State. 3 occurred northwest of Kingman just before 10 a.m., 1 north of McPherson at 10:40 a.m., 1 over Salina at 12:03 p.m., and 1 near Bennington, in Ottawa County about 11 a.m. None of the clouds came to the ground.
North Dakota, north-central and northeastern portions	24	All day						Minor	Snow	Unusually heavy snow ranging from 7 to 16 inches fell over much of this area, interrupting highway travel and disrupting some communication and power line services. A report from Munich indicated that barn roof caved in from weight of accumulated snow.
Jefferson, Copiah, Claiborne, Hinds, and Rankin Counties, Miss.	24	2 p.m.	10 to 50	90	0	0	40,000	5,000	Tornado and hail	Moved northeastward; light hail reported. Some out-buildings destroyed and others damaged. At Jackson 4 homes and several other buildings and trees damaged. At Fayette in Jefferson County, several houses and other buildings damaged.
Columbia City, Ind.	24	5 p.m.					2,000		Wind	Barn severely damaged, several telephone poles down, TV antenna snapped off, etc.
Iowa County, Iowa	24	5-5:30 p.m.			0	0		0	Tornado	Storm demolished barn and small buildings, killed 1 calf and a few chickens at West Pilot. In south portion of Williamsburg a "pillar" cloud, seen by several persons, demolished a pony shed.
Four Mile Bridge ( $1\frac{1}{2}$ miles south- west of Muscatine), Iowa	24	5 p.m.					3,000		Wind	Cattle shed demolished; poultry house damaged.
Natchitoches Parish, La.	24						20,000	500	do	Red Cross reported 1 home destroyed and 4 others damaged.
New Orleans, Orleans Parish, and Jefferson Parish, La.	25	2 a.m.			1	1	100,000		Rain	Broke all previous records for short interval rainfall at New Orleans: 5 minutes 0.91 inch; 10 minutes 1.48 inches; 15 minutes 1.90 inches; 20 minutes 2.21 inches; 30 minutes 3.18 inches; 45 minutes 4.07 inches; 60 minutes 4.71 inches; 120 minutes 5.87 inches; 150 minutes 5.89 inches. Homes, streets, stores, and other property flooded. 1 person killed and 1 injured in auto accident.
Wyoming, east-central portion	25	All day						Moderate	Wind	About one-half of winter wheat crop destroyed in some localities.
Leary (near), Calhoun County, Ga.	25	Late afternoon					300-500		do	High winds ripped off metal roofing from a building and tore small porch from home. Storm hit only small local area and was moving east-northeastward.
Washington, D. C. area and nearby Maryland	26	3:30 p.m.			1	2	3,000		do	Man killed by tree blown over by wind. Trees toppled. 2 barges torn loose from moorings in Potomac. 2 trailers blown over. Several trees smashed on top of parked cars. Small boat capsized in river. Power failures. 2 women injured when car was smashed by falling tree.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

APRIL 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Johnstown— Glovers- ville area, N. Y.	26	Night							Rain, hail, and wind	Thousands of dollars damage caused by heavy rain, hail, and wind. Winds estimated at 50 to 60 m.p.h. Trees, telephone lines, and electric service lines blown down. Much greenhouse glass broken by hail that averaged about 1 inch in diameter; 1 stone measured 3 1/2 inches. Automobile tops punctured by hail. Numerous cellars and basements flooded by heavy rain, while many cars stalled in flooded streets.
Manistique, Mich.	27	10 a.m.							Wind	Strong northeast winds caused a car ferry to go aground after being blown away from dock.
Modesto (north and west of), Calif.	27	1:15-1:30 p.m.			0	0	\$7,000		Tornado	A twister demolished a 32-stanchion dairy barn, damaged other structures, and uprooted trees. Twister was erratic, passing over some districts without damage. Power lines broken in 3 places.
Kingfisher and Cash- ion, King- fisher County, Okla.	27	7:50 p.m.					4,000		Winds	Damage in Kingfisher and vicinity \$3,000. Damage at Cashion estimated at \$1,000.
Dill City, Washita County, Okla.	27	8 p.m.	*4	11				\$5,000	Hail	Damage mostly to wheat and rye pastures.
From 12 miles west of Sentinel to Senti- nel, Washi- ta County, Okla.	27	About midnight	Nar- row	12			2,000		Wind	Damage to 1 barn, and 3 or 4 small outbuildings and chicken-houses.
Kiowa Coun- ty, Kans.	28	1 p.m.			0	0	0	0	Tornado	Tornado sighted aloft 3 miles west and 5 miles south of Greensburg.
Woodward, Okla.	28	3 p.m.	*5	5			3,000		Wind	Damage to cafe southeast of city, also damage in north edge of city to one machine shed and 5 brooder houses. High winds estimated at 80 m.p.h. Dust reduced visibility to less than 1 block.
Woodward (5 miles north of), Okla.	28	3 p.m.	Nar- row	Short	0	0	0	0	Tornado	Tornado funnel dropped to ground and moved over open ranch land.
Mansfield, Tarrant County, Tex.	28	3:50 p.m.	100	1/2			1,000		Wind and hail	Trees blown down; barns and sheds damaged or destroyed; TV antennae damaged. Hail caused no damage.
Calvin (near), Hughes County, Okla.	28	4 p.m.					5,000		Electri- cal and rain	House struck by lightning. 4.70 inches of rain washed out some roads and bridges with minor damage.
Antlers (25 miles northeast of), Push- mataha County, Okla.	28	4:15 p.m.	100**200		0	0	200	0	Tornado	Several buildings damaged on one farm in Divide School community. Path northeastward.
Ord (8 miles north of), Nebr.	28	4:30-5 p.m.	30	1/4	0	0	1,200	0	do	1 cowshed destroyed.
Smithville, Bastrop County, Tex.	28	6:45 p.m.	200	1/2	0	3	15,000		do	Completely demolished home when wind moved it 200 yards and injured occupants. Damaged roofs, leveled garages.
Bradshaw, Nebr.	28	7 p.m.	Nar- row	Short	0	0	500	0	do	Chicken house destroyed, and minor damage to adjacent structures.
Helotes, Bexar Coun- ty, Tex.	28	8:05 p.m.	2 to 300	10	0	7	100,000	Minor	do	Tornado moved east-northeastward. 2 homes destroyed, 2 more possibly destroyed, and 15 seriously damaged.
San Antonio (3 miles north of Airport), Tex.	28	3:45 p.m.	150 to 250	5	1	5	75,000		do	Woman killed and 5 members of family injured when home "exploded". 1 home destroyed. Barns and outbuildings destroyed.
Center, Shelby Coun- ty, Tex.	23	10:30 p.m.	440	20			20,000		Wind and electri- cal	Unroofed barns, broiler houses, and homes. 90 per- cent wind damage; 10 percent rain damage.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

APRIL 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Jasper, Jasper County, Tex.	28						\$1,500	\$10,000	Hail and wind	Hail damage to homes. Crops washed in drain areas. 10 percent hail damage; 90 percent rain damage.
De Soto, Natchitoches, and Jackson Parishes, La.	28						20,000	5,000	Thunder-squalls	Red Cross reported 5 outbuildings destroyed, 18 homes and 16 outbuildings damaged; all in De Soto Parish.
El Paso County, Tex.	28-30						10,000	15,000	Wind and dust	High winds with severe dust- and sandstorms, particularly on 29th. Cotton crop ruined by sand blasting; 2 roofs blown off; billboards blown down; and considerable damage to paint and glass in automobiles.
Lincoln Parish, La.	29	12:30 a.m.			0	0	2,500	1,000	Tornado (possible)	3 miles south of Choudrant and 8 miles east of Ruston, 6 houses and several outbuildings damaged. May have been high winds.
Pyriton, Clay County, Ala.	29	1:30 a.m.	200	1½			1,000		Wind	Storm moved northeastward. Roofs damaged; trees uprooted; few small buildings blown down.
Louisiana, entire State	29	All day			3	10	650,000	125,000	Winds, thunder-squalls, and rain	High winds entire State; severe thunderstorms and squalls swept over Louisiana and moved into Mississippi. 5 passenger cars of Kansas City and Southern Railroad lines train, Southern Belle, were derailed near Montgomery, La., by washout; 10 persons injured. In New Orleans, trees, signs, and power and telephone lines blown down; damage in New Orleans \$35,000. Montgomery had 5.50 inches of rain in 10-hour period, Shreveport and Alexandria 7.00 inches each, and Leesville 10.00 inches. Homes, streets, and other property flooded; several highways closed. 1,000 persons evacuated from homes in and around Alexandria. Cotton and corn fields flooded; soil eroded.
Lake Charles, Calcasieu Parish, La.	29	Afternoon			0	0	2,000	0	Tornado	250 yards southwest of Weather Bureau Office at airport. Winds 75 m.p.h.; barometer fell from 29.36 to 29.12 inches, then back to 29.34 inches. Funnel cloud down to 400 feet of ground. Several buildings damaged.
Lane County, Kans.	29	2-4 p.m.	70	** 500-600	0	0	0	0	Tornadoes	2 tornadoes sighted, both moving northeastward. 1 occurred 7 to 8 miles southwest of Dighton, but did not touch ground. It was followed by heavy local rain. The second one, about 1 to 2 miles northwest of Dighton, dipped a time or two in open country and shaved wheat stubble from ground. It was also followed by heavy rain in very small area.
Sumner County, Kans.	29	3 p.m.					5,000		Electrical	Two-story house and all of second-story contents burned 4 miles southeast of Conway Springs after being struck by lightning.
Auburn, Bowman, Newcastle, Ophir, and Mt. Vernon districts, Placer County, Calif.	29	3:30-3:45 p.m.; 5-5:10 p.m.; 5:30-5:40 p.m.						750,000	Hail	Hail marked pears, plums, cherries, and peaches, requiring farmers to thin fruit again. Hail damage will require extra care in sorting at packing houses. Damage heavy over 5 square miles and light over an additional 5 square miles.
Salina, Kans.	29	4:40-4:55 p.m.	220	½			500		do	In northeastern section of Salina hailstones up to size of marbles accumulated to depth of 2 inches in places. Greenhouse panes broken, and gardens damaged.
Kelsey and Garden Valley areas, El Dorado County, Calif.	29	P.m.							do	Hailstorm moved northeastward over Kelsey and Garden Valley areas. Average size of hailstones about 1/8 inch, with largest sizes about 1/4 inch. Cherry crops practically a total loss, locally; apples sustained light loss; pears took from 50 percent to almost total loss, varying with orchard and location. Only 6 orchards affected to any extent.
Mississippi, entire State	29-30				1	2	100,000	300,000	Thunder-squalls, winds, rains, and flash floods	High winds, severe thunderstorms, and squalls swept over entire State. 1 person killed at Byhalta; 2 injured at Natchez by landslide. 7.20 inches of rain measured within a 6-hour period at Clinton, in Hinds County; winds to 60 m.p.h. damaged power lines and trees; homes, stores, streets, and other property flooded. 50 families evacuated at Jackson. 7.25 inches of rain at Vicksburg within 8-hour period; parts of city and surrounding country flooded.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

APRIL 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Mississippi, entire State (Cont'd.)	29-30									Landslide occurred on U. S. Highway 80 between Bolton and Edwards; winds to 50 m.p.h. damaged trees. Claiborne County, heavy rains; 5 homes evacuated. Yazoo County, lowlands flooded; 1 house damaged and trees uprooted at Yazoo City. Vegetable growers entire State suffered very heavy damages from winds, rains, and floods.
St. Louis, Mo.	29	7 p.m.					\$10,000		Wind	Strong winds over eastern part of State which reached peak speeds between 7:00 and 7:30 p.m., caused light damage over wide area, principally in St. Louis area. Peak gust of 82 m.p.h. recorded at Lambert-St. Louis Weather Bureau Station.
Illinois, central and northern portions	29-30	8 p.m.— 3 a.m.					200,000		do	High winds in many central and northern localities night of 29th and early morning of 30th. Many store windows smashed, trees downed, and utility lines damaged.
Greenville (1 mile east of), Butler County, Ala.	30	1:30 a.m.	400	1			3,000	\$5,000	Wind and rain	Damaged 6 farm buildings and homes, 1 tourist court. Limbs blown from trees, damaging automobiles and buildings. Most crop damage due to rain.
Douglasville (near), Douglas County, Ga.	30	5 a.m.					2,500		Electrical	Lightning struck rural home, 4 miles east of Douglasville, demolishing 1 room and part of another.
Beaver Run Community (near Nor- cross), Gwinnett County, Ga.	30	5:30-5:35 a.m.	440	2			5,000		Wind (pos- sibly tor- nadic)	Storm, possibly tornadic, did spotted damage; 1 home unroofed with resultant damage to furnishings from rain; trees fell on and smashed in roof of another home; barn destroyed, and automobile badly damaged by falling tree. Many trees and some utility lines blown down. Storm moved northeastward.
Atlanta, Ga.	30	8 a.m.					3,200		Electrical and wind	Lightning struck business house about 3 miles north of downtown section, causing fire that destroyed furnishings and upper floor. High winds blew down 4 power lines in downtown Atlanta about same time, loss about \$200.
Columbia, S. C.	30	11 a.m.				Sev- eral	20,000		Wind and rain	Several motor accident injuries indirect result of heavy rain.
Rapides, Caddo, and Allen Par- ishes, La.	30	Day					10,000	5,000	Rains and floods	Water in some homes up to 3 to 4 feet deep following heavy rains of 29th; 125 families affected.
Baldwin County (eastern portion), Ga.	30	12:30- 2:30 p.m.	600	Short			90,000		Rain and wind (possi- bly tor- nadic)	Heavy torrential rains caused heavy damages to planted crops and erosion of soil; losses estimated at \$75,000; time of rains about 12:30 p.m. From 2 to 2:30 p.m., a storm, possibly tornadic in character, moved southeastward. It ripped roofs off several houses and heavily damaged barns and timber. Location near Baldwin-Washington County line. Damage by wind \$15,000.
Buena Vista (near), Marion County, Ga.	30	3 p.m.			0	3	See remarks	Slight	Tornado	Trees uprooted for miles around; in small area near Buena Vista, 1 home destroyed and another home damaged, with moderate to heavy damages to several other buildings; some power and telephone lines blown down; 4 families involved.
Sutherland, Va.	30	3 p.m.	880	4			6,000		Wind	Buildings damaged in vicinity.
Fort Valley (near), Peach Coun- ty, Ga.	30	5:10-5:15 p.m.	100	1	0	2	15,000	3,500	Tornado	Storm moving east-northeastward, occurred 2 miles south of Fort Valley. 7 families on 2 farms affected, with 3 homes destroyed and 1 damaged and numerous instances of roof damage; tractor damaged. Garden and row of pecan trees destroyed.
Warner Rob- bins, Ga.	30	5:12-5:28 p.m.	250 to 300		18	300	15,000,000		Tornado and hail	Wide bottom tornado funnel observed 5 minutes before storm struck. Storm, moving east-northeastward, first struck city farm on Pleasant Hill Rd., thence through housing project at Warner Robbins via Pagans Mill Rd., and Second & Third Avenues. Terrific winds, exceeding 100 m.p.h., destroyed 275 apartment units, 65 homes, and 25 trailers, heavily damaging 84 apartment units, 135 homes, with extensive destruction and damage to many other structures and property. Pieces of property hurled high in air and scattered $\frac{1}{2}$ mile or more from main path of storm; deaths and injuries due mainly to flying brick and other debris. Heavy hail as large as golf balls accompanied storm, losses from which indistinguishable from total losses; 600 families affected.

See footnotes at end of table.



# SEVERE STORMS

Table 4—Continued

APRIL 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Dry Branch (near), Twiggs County, Ga.	30	5:30 p.m.			1	3			Tornado	Church demolished, porch roof blown off, automobile damaged, and several other houses and other property damaged on Reggins Mill Rd.
Jefferson- ville (near), Twiggs County, Ga.	30	5:30 p.m.			1	2	\$300,000		do	Near Kooler Mines on Reggins Rd. Skirted downtown section of Jeffersonville, moving northeastward in rural section. Much timber damaged, 4 rural homes destroyed and 11 damaged; 15 families affected. This may be same storm that struck Dry Branch. Note: Late evening tornadoes of April 30 followed a general path starting at about Buena Vista and moving near Fort Valley and through Warner Robbins, dying out in the rural section of Twiggs County.
Abingdon (near), Va.	30	6:45 p.m.	220	** 880	0	0	1,000		do	Damage confined to buildings within a small area.
Jones and Onslow Counties, N. C.	30	7 p.m.			0	0	1,000		do	Red Cross reports minor damage to roofs; 3 outbuildings destroyed.
Franklin, Ind.	30					2	3,000		Wind	Wind lifted portion of packing plant roof and slammed it against a dwelling, injuring 2 of its occupants.

\* Miles instead of yards.

\*\* Yards instead of miles.

o Crop damage included with other property damage.

# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

APRIL 1953

Severe flooding developed in the Louisiana and east Texas streams in the beginning of May from the heavy rainfall towards the end of April. The upper Calcasieu River reached its highest stage since 1885. Flooding elsewhere was mostly minor.

**ATLANTIC SLOPE.**--The heavy rain on the 12-13th caused minor flooding in the lower portions of the Roanoke, Neuse and Cape Fear Rivers in eastern North Carolina, between the 13th and the 20th. The rain averaged 1-1/4 inches on the Dan and Roanoke Basins, 1-1/2 inches on the Cape Fear and Tar Basins and 2 inches on the Neuse Basin. High water delayed river traffic along the lower Cape Fear and hampered logging operations on the lower Roanoke.

The Pee Dee River which crested at Peedee, S. C. on March 31 receded to within its banks on April 4. Rivers in South Carolina continued to recede during April and reached their lowest stages since January.

The major flooding on the Altamaha River at Charlotte, Ga. between the 14th and 20th was due to rain between the 10th and 13th. Heavy rains on the 7th accounted for the heavy runoff during that period. The torrential rains on the 30th in the upper Ocmulgee and Oconee Basins caused a rapid rise of 18 feet in 10 hours to 5 feet above flood stage at Macon, Ga. by midnight. The improved levee system at Macon is adequate so the damage was only nominal.

**EAST GULF OF MEXICO.**--Heavy rains during the second week in the month caused light flooding on the Apalachicola River at Blountstown, Fla. between the 13th and 24th. The above flood stage at Blountstown did no damage and was actually beneficial to the logging interests.

The Pearl River at Bogalusa, La. was out of its banks four times during the month. During the last rise there was general flooding in the reach at and below Jackson, Miss. with severe flooding at Jackson, Miss. This overflow was due to heavy rain on the 24th, 25th and 29th. During the first storm the rainfall ranged from 1.1 inches at Louisville on the headwaters of the Pearl River to 7.21 inches at Pearl River, La. Nearly 5 inches of precipitation occurred in the upper Pearl on the 29th. Stores and buildings on Farish Street in Jackson, Miss. were flooded, and in the low residential areas about 50 families were rescued by boat. The flood was still in progress by the end of the month.

**Upper Mississippi.**--Some flooding occurred along the main stem of the Mississippi in the reach between Hannibal, Mo. and Winfield, Mo. (Dam 25)

during the first decade of the month. This rise was due to the heavy rains in the immediate tributaries during the last three days of March along the Mississippi itself. Minor flooding occurred along bottomlands of the Des Moines River in Iowa and along the Fox River in Missouri. No damages were reported as no crops had been planted.

**Ohio Basin.**--The flooding on the lower Wabash and on the lower West Fork of the White Rivers in Indiana between the 2nd and 4th was due to heavy rain which ended on the 1st. The rainfall averaged 1-1.5 inches over the upper Wabash above Montezuma, Ind. Along the lower Wabash the rainfall amounts were insignificant and no flooding occurred. No damage was reported.

**White, Arkansas and Red Basins.**--The flooding in the White River Basin during the beginning of the month was due to continued high water from March. No damage was reported.

Minor flooding occurred in the Arkansas Basin on the Poteau River at Poteau, Okla. on three different occasions during April. This flooding was due to frequent shower activity which was heavy over the Poteau River Basin during the 24-hour period ending on the morning of the 6th (1.75 inches), 24th (3.35 inches), and 29th (2.25 inches). No damage was reported.

The same storms caused heavy precipitation in the Red River Basin with minor flooding on the Ouachita, Sulphur and Little Rivers. There was little or no damage since the land was mostly timbered.

**Lower Mississippi and Atchafalaya Basins.**--The high water on the Tallahatchie and Yazoo Rivers was due to heavy rain in March. No damage was reported.

The overflow on the Atchafalaya River at Morgan City, La. on the 29th was due to strong southerly winds and tidal effect. No damage was reported from high water conditions.

**WEST GULF OF MEXICO.**--The heavy rainfall on the 28th and 29th resulted in major floods on streams in central and western Louisiana and east Texas in the beginning of May. The rainfall over the Sabine averaged 2.6 inches in the upper portion, 4.1 inches over the middle portion and 9.8 inches over the lower Sabine. In the Calcasieu, the rainfall averaged 4.1 inches. Flooding was the most severe in the upper Calcasieu River Basin and Sabine River tributaries. According to old settlers the 20.5 foot stage on the Calcasieu at Oakdale, La. was the highest stage of record or memory, at least since 1885. Many roads were closed by overflows and washouts with the resulting damage to roads and bridges extremely heavy.



# FLOOD STAGE DATA

(All dates in April unless otherwise specified)

Table S

APRIL 1953

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
Roanoke: Williamston, N. C.	10	Mar. 27 14	13 19	11.2 10.1 <sup>o</sup>	5 17
Neuse: Smithfield, N. C.	13	13	16	15.2 <sup>o</sup>	15
Goldsboro, N. C.	14	Mar. 31 16	3 20	14.6 <sup>o</sup> 15.5 <sup>o</sup>	2 18
Cape Fear: Lock No. 2, Elizabethtown, N. C.	20	13	16	22.7	15
Pee Dee: Peedee, S. C.	19	Mar. 26	4	22.6	Mar. 31
Ocmulgee: Macon, Ga.	18	30	May 3	23.0	May 1
Altamaha: Charlotte, Ga.	12	14	20	13.2	17
EAST GULF OF MEXICO DRAINAGE					
Apalachicola: Blountstown, Fla.	15	13	24	18.6	16-17
Pearl: Jackson, Miss.	18	30	**	31.6	May 9
Monticello, Miss.	15	30	**	22.5	May 5-6
Bogalusa, La.	15	Feb. 14 14 18 26	5 15 18 **	19.3 16.2 15.5 17.7	Mar. 18 15 18 28
Pearl River, La.	12	Feb. 18 29	4 **	15.3 16.2	Mar. 20 May 10
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Des Moines: Eddyville, Iowa	15	Mar. 31	1	15.4	Mar. 31
Fox: Wayland, Mo.	15	Mar. 31	2	17.3	1
Mississippi: Hannibal, Mo.	16	1	4	16.6	2
Louisiana, Mo.	15	1	5	16.1	3
Dam 24, Clarksville, Mo.	23	1	6	26.1	3
Dam 25, Winfield, Mo.	23	1	7	26.2	4
Ohio Basin					
West Fork: Edwardsport, Ind.	12	2	4	14.3	3
Wabash: Lafayette, Ind.	11	2	2	11.4	2
Montezuma, Ind.	14	2	4	15.3	3
White Basin					
White: Georgetown, Ark.	21	Mar. 20	2	23.3	Mar. 24
Des Arc, Ark.	24	Mar. 22	1	26.6	Mar. 25
Clarendon, Ark.	26	Mar. 21	16	29.3	Mar. 28-29
St. Charles, Ark.	25	Mar. 24	19	27.2	Mar. 31-1
Arkansas Basin					
Poteau: Poteau, Okla.	24	6 24 29	7 25 30	25.8 <sup>o</sup> 27.2 26.8	6 24 29
Red Basin					
Ouachita: Arkadelphia, Ark.	17	6 25 30	7 25 30	20.0 19.5 20.0	6 25 30
Camden, Ark.	26	9 27	12 **	27.9 27.1 33.0	10 28 May 4
Little: Whitecliffs, Ark.	25	8 27	10 **	25.7	10
Sulphur: Naples, Tex.	22	11	14	23.1	12
Lower Mississippi Basin					
Coldwater: Serah, Miss.	18	Mar. 22 30	6 **	19.6 20.2	6 30
Tallahatchie: Swan Lake, Miss.	26	Mar. 23	1	26.9	Mar. 28
Yazoo: Yazoo City, Miss.	29	Mar. 31 30	7 **	29.2	3
Atchafalaya Basin					
Atchafalaya: Morgan City, La.	6	29	29	7.7	29
WEST GULF OF MEXICO DRAINAGE					
Sabine: Mincola, Tex.	14	28	May 7	19.9	May 2
Quitman, Tex.	16	27 30	27 **	16.3	27

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
WEST GULF OF MEXICO DRAINAGE (Cont'd.)	<i>Fl</i>			<i>Fl</i>	
Sabine: (Cont'd.) Milam, Tex.	35	30	**	40.4	May 7
Bon Wier, Tex.	17	30	**	23.3	May 1
Neches: Evadale, Tex.	16	Mar. 26	3	16.6°	2
East Fork: Rockwall, Tex.	10	29	May 1	18.4	30
Trinity: Dallas, Tex.	28	29	May 1	32.4	30
Rosser, Tex.	26	29	30	26.4	29
Liberty, Tex.	24	30	**		
Guadalupe: Gonzales, Tex.	20	30	**	31.1	30

\* Provisional  
 \*\* Continued at end of month  
 ° Highest stage reported but not necessarily the crest

# RADIOSONDE DATA

Average monthly values

APRIL 1953

Table 20

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. ( 832 MB.)				ATLANTA, GA. ( 978 MB.)				BIG SPRING, TEX. ( 920 MB.)				BISMARCK, N. DAK. ( 954 MB.)				BOISE, IDAHO ( 912 MB.)				BROWNSVILLE, TEX. (1009 MB.)				BUFFALO, N. Y. ( 984 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	1,619	13.9	27	30	309	14.9	63	30	784	18.5	33	29	505	2.8	67	30	868	9.3	53	28	7	23.0	80	29	221	5.6	74
1,000---	30	32			30	116			30	55			29	118			30	94			28	7	22.4	79	29	86		
950----	30	480			30	553	15.0	53	30	503			29	540	2.2	64	30	531			28	543	21.2	68	29	512	5.3	64
900----	30	952			30	1,010	12.3	52	30	969	18.3	32	29	975	1.4	58	30	978	10.2	42	28	1,003	20.4	49	29	946	2.6	66
850----	30	1,437			30	1,487	9.7	47	30	1,456	15.3	31	29	1,433	-2.0	61	30	1,451	7.0	43	28	1,494	18.5	36	29	1,405	-5.6	66
800----	30	1,949	12.2	24	30	1,989	7.6	39	30	1,968	12.7	29	29	1,912	-4.9	63	30	1,945	2.9	48	28	2,012	16.6	32	29	1,888	-3.2	63
750----	30	2,488	7.8	27	30	2,521	4.8	39	30	2,509	8.9	31	29	2,422	-7.8	63	30	2,464	-1.2	51	28	2,567	13.5	34	29	2,403	-5.7	60
700----	30	3,048	3.0	32	30	3,078	1.6	34	30	3,072	4.4	34	29	2,950	-10.9	64	30	3,010	-5.2	54	28	3,135	9.5	32	29	2,934	-8.5	58
650----	30	3,640	-2.1	39	30	3,675	-2.0	36	30	3,674	-4.4	37	29	3,524	-13.8	62	30	3,593	-9.4	50	27	3,751	5.2	33	29	3,512	-11.7	53
600----	30	4,273	-7.6	47	30	4,303	-5.7		30	4,305	-4.9	37	28	4,122	-16.9	59	30	4,202	-13.2	47	26	4,394	-7	35	29	4,114	-15.1	53
550----	30	4,941	-12.9	51	30	4,986	-10.0	31	30	4,990	-9.8	36	28	4,774	-20.8	54	30	4,861	-17.5	46	26	5,087	-4.6	39	29	4,772	-19.0	50
500----	30	5,663	-18.1	46	30	5,709	-14.9	32	30	5,711	-15.3	36	28	5,468	-25.3	51	30	5,566	-22.6	46	26	5,829	-10.2	42	29	5,470	-23.3	45
450----	30	6,448	-23.2	39	30	6,503	-20.4		30	6,507	-20.7		28	6,232	-30.4	48	30	6,335	-28.1	46	26	6,643	-15.9	44	29	6,235	-28.5	44
400----	30	7,294	-29.4	35	30	7,360	-26.6		30	7,360	-26.6		28	7,052	-36.6		30	7,164	-34.1		24	7,512	-22.2	44	27	7,079	-34.2	45
350----	30	8,234	-36.4		30	8,310	-33.6		30	8,310	-33.6		26	7,967	-43.3		30	8,090	-41.1		24	8,478	-29.2	39	27	8,000	-40.7	
300----	30	9,285	-44.1		30	9,374	-41.7		30	9,365	-41.9		26	8,988	-50.1		30	9,122	-47.9		24	9,560	-37.4		27	9,031	-47.9	
250----	29	10,487	-52.3		30	10,589	-50.1		29	10,577	-49.8		26	10,167	-53.3		30	10,306	-53.4		24	10,792	-47.0		27	10,218	-52.3	
200----	28	11,913	-58.2		30	12,020	-57.9		29	12,010	-57.4		25	11,606	-53.4		29	11,724	-56.1		24	12,234	-57.4		24	11,668	-52.9	
175----	28	12,752	-58.8		30	12,857	-60.0		26	12,848	-58.6		25	12,467	-52.5		28	12,565	-55.2		24	13,067	-62.2		22	12,528	-53.0	
150----	28	13,720	-58.5		30	13,818	-60.4		26	13,814	-59.5		25	13,463	-52.9		28	13,549	-54.3		23	14,014	-64.7		21	13,130	-54.2	
125----	27	14,869	-59.0		29	14,947	-61.9		25	14,944	-62.1		24	14,652	-52.3		26	14,725	-55.2		21	15,117	-68.3		19	14,688	-53.5	
100----	27	16,259	-61.7		28	16,321	-63.6		24	16,322	-63.1		23	16,083	-53.2		26	16,147	-56.3		16	16,448	-71.6		18	16,114	-55.3	
80----	22	17,645	-62.4		25	17,685	-63.8		24	17,690	-63.7		23	17,515	-54.2		24	17,554	-55.9		12	17,766	-71.0		16	17,534	-56.1	
60----	19	19,428	-59.2		20	19,459	-60.8		21	19,465	-60.1		22	19,356	-54.1		22	19,376	-55.4		9	19,484	-66.4		12	19,356	-55.3	
40----	15	20,575	-57.9		17	20,592	-59.2		17	20,614	-58.2		19	20,523	-53.5		19	20,547	-55.0		8	20,602	-61.6		10	20,507	-54.4	
30----	11	21,994	-56.0		17	21,997	-57.1		15	22,031	-55.9		15	21,959	-53.1		16	21,991	-53.8		8	22,001	-56.4		7	21,940	-53.8	
20----					8	23,814	-54.7		8	23,866	-52.8		8	23,841	-52.8		12	23,843	-53.3		7	23,834	-52.8					
Standard pressure surface (mb.)	BURRWOOD, LA. (1013 MB.)				CARIBOU, ME. ( 984 MB.)				CHARLESTON, S. C. (1012 MB.)				COLUMBIA, MO. ( 983 MB.)				DODGE CITY, KANS. ( 920 MB.)				EL PASO, TEX. ( 876 MB.)				ELY, NEV. ( 804 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	29	3	19.9	86	30	191	3.4	77	29	113	16.1	78	30	238	9.7	65	29	792	10.0	53	30	1,195	19.6	18	30	1,908	6.3	38
1,000---	29	115	20.2	77	30	55			29	114	17.6	68	30	90			29	83			30	35			30	72		
950----	29	563	18.5	67	30	477	3.5	71	29	560	16.5	59	30	522	9.2	59	29	514			30	490			30	515		
900----	29	1,020	16.1	59	30	910	-9	72	29	1,011	13.9	52	30	964	6.4	61	29	970	9.6	54	30	959			30	969		
850----	29	1,505	14.5	44	30	1,367	-1.9	75	29	1,491	11.2	44	30	1,430	3.3	66	28	1,444	8.4	51	30	1,451	18.3	18	30	1,445		
800----	29	2,015	12.3	39	30	1,847	-4.6	73	29	1,995	8.5	41	30	1,919	-5.6	67	28	1,942	5.6	47	30	1,965	13.9	21	30	1,950	8.4	31
750----	29	2,562	9.5	32	30	2,361	-6.6	68	29	2,534	6.0	34	30	2,442	-1.9	62	27	2,469	2.7	47	30	2,506	9.5	24	30	2,478	4.3	34
700----	29	3,122	6.1		30	2,890	-8.8	61	29	3,087	2.8	31	30	2,982	-4.5	58	27	3,022	-4.4	49	30	3,071	4.6	29	30	3,035	-6.6	40
650----	29	3,727	2.4		30	3,470	-11.6	54	29	3,690	-9		30	3,570	-7.5	54	28	3,610	-4.8	52	30	3,672	-2.2	33	30	3,625	-5.9	48
600----	29	4,368	-1.6		30	4,070	-15.3	51	29	4,317	-4.9		30	4,182	-11.1	52	28	4,233	-9.3	52	30	4,303	-4.9	33	30	4,243	-11.1	53
550----	29	5,052	-6.2	30	30	4,726	-19.3	50	29	5,001	-9.4		30	4,850	-15.3	48	27	4,902	-14.3	52	30	4,983	-9.7		30	4,908	-16.0	54
500----	29	5,793	-11.4		30	5,425	-23.9	48	29	5,725	-14.3		30	5,558	-20.1	41	27	5,618	-19.6	46	30	5,709	-14.7		30	5,616	-20.8	51
450----	28	6,598	-17.7		30	6,192	-29.2	47	29	6,521	-19.9		30	6,340	-25.5	36	26	6,395	-25.6	44	30	6,502	-20.8		30	6,395	-26.1	48
400----	27	7,461	-24.4		30	7,017	-35.2	45	29	7,379	-26.3		30	7,175	-31.4	34	25	7,238	-31.4	42	30	7,357	-27.1		30	7,229	-32.1	45
350----	27	8,419	-31.4		30	7,932	-42.0		29	8,324	-33.6		30	8,106	-38.3		25	8,169	-37.1		30	8,302	-34.3		30	8,158	-39.0	
300----	27	9,492	-39.3		29	8,963	-48.7		29	9,392	-41.4		30	9,149	-45.2		22	9,220	-44.9		30	9,359	-42.3		30	9,198	-45.9	
250----	27	10,715	-48.3		29	10,149	-51.8		29	10,604	-50.3		30	10,346	-52.0		22	10,419	-51.6		30	10,566	-50.3		30	10,393		



# RADIOSONDE DATA

Average monthly values

Table 20-Continued

Standard pressure surface (mb.)	INTERNAT. FALLS, MINN. (969 MB.)				LAKE CHARLES, LA. (1012 MB.)				LANDER, WYO. (824 MB.)				LAS VEGAS, NEV. (931 MB.)				LITTLE ROCK, ARK. (1002 MB.)				MAZATLAN, MEXICO (1009 MB.)				MEDFORD, ORE. (968 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	360	1.9	62	30	5	18.7	79	30	1,696	3.7	59	29	660	19.9	16	30	79	14.9	65	30	14	22.5	76	30	401	11.4	60
1,000---	30	105			30	105	19.2	72	30	88			29	39			30	94	13.8	56	30	95	21.7	73	30	123		
950---	30	519	2.7	55	30	550	17.2	68	30	523			29	489			30	531	14.2	54	30	549	22.5	36	30	560	11.9	50
900---	30	957	3.7	57	30	1,006	15.2	63	30	972			29	955	19.7		30	983	11.4	55	30	1,010	21.5	28	30	1,005	8.5	54
850---	30	1,411	-3.8	61	30	1,490	14.0	51	30	1,441			29	1,443	15.5		30	1,458	8.5	55	30	1,503	18.5	26	30	1,474	4.7	61
800---	30	1,887	-6.6	60	30	1,999	11.7	42	30	1,936			29	1,952	11.0	22	30	1,958	6.3	50	30	2,019	15.4		30	1,965	1.0	52
750---	30	2,395	-9.0	54	30	2,544	8.7	39	30	2,460	-3.5	52	29	2,487	6.4	26	30	2,489	4.0	50	30	2,570	12.0		30	2,484	2.7	59
700---	30	2,920	-11.8	52	30	3,104	5.2	39	30	3,004	-4.5	55	29	3,047	1.6	32	30	3,043	1.1	48	29	3,136	8.6		30	3,024	-6.0	53
650---	30	3,493	-14.7	55	30	3,706	1.1	36	30	3,591	-8.9	57	29	3,641	-3.4	37	29	3,642	-2.3	39	29	3,745	4.5		29	3,607	-9.7	50
600---	30	4,086	-18.4	56	30	4,343	-3.2		30	4,197	-13.2	55	29	4,266	-7.8	37	29	4,268	-6.3	34	29	4,390	1		29	4,213	-13.1	42
550---	30	4,733	-22.6	56	30	5,025	-7.9		30	4,856	-17.6	48	29	4,938	-12.2	34	29	4,942	-10.8	35	29	5,079	-4.7		29	4,877	-17.2	41
500---	30	5,423	-27.0	57	30	5,760	-13.0		30	5,561	-22.1	41	28	5,658	-17.0		29	5,669	-15.8	31	29	5,823	-10.0		29	5,579	-21.9	42
450---	30	6,177	-32.2	53	30	6,561	-18.8		30	6,334	-27.7	40	28	6,445	-22.5		29	6,462	-21.1		29	6,628	-15.8		29	6,354	-27.6	
400---	30	6,996	-38.0		30	7,422	-25.4		29	7,171	-33.6		28	7,295	-28.6		29	7,314	-27.5		29	7,506	-21.8		29	7,182	-37.7	
350---	30	7,901	-44.5		30	8,376	-32.6		29	8,093	-40.6		28	8,236	-35.9		29	8,259	-34.6		29	8,475	-28.6		29	8,105	-39.9	
300---	30	8,916	-50.7		30	9,444	-40.2		29	9,125	-47.9		28	9,288	-43.7		29	9,318	-42.1		28	9,559	-36.5		29	9,143	-46.1	
250---	30	10,093	-52.9		30	10,663	-48.8		29	10,309	-53.7		27	10,495	-52.3		29	10,528	-49.9		27	10,799	-45.6		29	10,337	-52.3	
200---	30	11,538	-50.4		30	12,096	-58.0		27	11,738	-55.9		27	11,914	-58.1		28	11,964	-56.8		7	12,216	-55.6		29	11,761	-56.8	
175---	30	12,409	-49.7		29	12,932	-60.9		25	12,594	-55.2		27	12,752	-58.7		27	12,804	-58.5		27	12,606	-56.6		29	12,606	-56.6	
150---	30	13,416	-49.7		29	13,886	-62.3		25	13,581	-54.0		27	13,773	-57.9		27	13,773	-58.2		27	13,584	-56.1		29	13,584	-56.1	
125---	28	14,599	-50.2		29	15,004	-64.8		24	14,745	-55.0		27	14,867	-59.0		26	14,918	-59.7		26	14,918	-59.7		29	14,741	-56.7	
100---	28	16,051	-51.7		28	16,360	-66.5		23	16,160	-55.7		25	16,257	-61.4		24	16,304	-62.1		24	16,304	-62.1		28	16,144	-57.8	
80---	27	17,492	-52.9		25	17,706	-66.5		19	17,583	-56.2		23	17,642	-61.4		21	17,675	-61.9		21	17,675	-61.9		28	17,552	-57.2	
60---	27	19,341	-53.6		20	19,452	-63.0		16	19,410	-55.4		19	19,436	-59.5		20	19,453	-60.4		20	19,453	-60.4		23	19,367	-56.7	
50---	26	20,514	-53.5		19	20,583	-59.0		15	20,585	-54.6		15	20,581	-57.5		18	20,596	-57.8		18	20,596	-57.8		19	20,532	-55.8	
40---	26	21,937	-53.5		15	22,000	-54.9		6	22,028	-54.3		8	22,009	-56.2		12	21,993	-56.1		12	21,993	-56.1		18	21,952	-54.6	
30---					5	23,841	-53.0										6	23,796	-54.2						14	23,794	-54.2	

MERRIDA, MEXICO (1007 MB.)				MIAMI, FLA. (1015 MB.)				NANTUCKET, MASS. (1007 MB.)				NASHVILLE, TENN. (992 MB.)				NORTH PLATTE, NEBR. (913 MB.)				OAKLAND, CALIF. (1015 MB.)				OKLAHOMA CITY, OKLA. (965 MB.)				
SURFACE	30	27	28.5	66	30	4	23.4	74	30	14	6.9	89	30	177	13.0	67	29	849	5.5	67	30	6	12.2	75	30	391	12.4	66
1,000---	30	93	28.1	67	30	132	23.0	71	30	70	7.9	79	30	106			29	86			30	128	11.1	74	30	87		
950---	30	550	25.8	67	30	581	20.4	64	30	498	7.7	66	30	539	12.2	55	29	518			30	556	10.8	61	30	524	12.9	55
900---	30	1,022	23.7	65	30	1,043	17.5	62	30	938	5.2	56	30	988	9.2	57	29	961	6.0	58	30	1,006	9.9	49	30	973	10.9	55
850---	30	1,521	20.9	68	30	1,529	15.0	49	30	1,403	2.3	68	30	1,459	6.2	59	29	1,428	4.0	58	30	1,478	7.3	48	30	1,449	9.4	50
800---	30	2,043	17.7	66	30	2,041	13.0	37	30	1,890	-7.6	68	30	1,955	4.6	52	29	1,918	1.3	59	30	1,974	4.4	41	30	1,950	7.1	47
750---	30	2,597	15.1	52	30	2,586	10.5	35	30	2,408	-3.0	57	30	2,485	2.0	49	29	2,440	-1.8	61	30	2,500	1.4	38	30	2,480	4.5	43
700---	30	3,174	12.0	36	30	3,152	7.4		30	2,947	-5.8	53	30	3,032	-1.2	50	29	2,981	-5.0	61	30	3,049	-1.1	39	30	3,037	-1.1	38
650---	30	3,795	8.2	30	3,761	3.9		29	3,528	-9.0	49	30	3,626	-4.9	45	29	3,568	-8.7	58	30	3,634	-5.9	40	30	3,632	-2.8	37	
600---	29	4,445	3.7	31	30	4,403	-1.1		29	4,140	-12.1	41	30	4,242	-8.9	48	29	4,176	-12.4	53	30	4,256	-10.0	40	30	4,258	-7.1	35
550---	28	5,143	-1.2	32	30	5,093	-5.0	31	29	4,803	-16.3	39	30	4,920	-12.9	44	27	4,839	-16.8	50	30	4,922	-14.3	35	30	4,933	-11.6	
500---	27	5,898	-6.1	32	30	5,836	-9.9	31	29	5,510	-21.4	41	30	5,633	-17.7	41	27	5,544	-21.7	46	29	5,636	-19.1		30	5,655	-16.7	
450---	25	6,721	-11.7		30	6,649	-15.4		29	6,286	-26.8	39	30	6,421	-22.8	38	27	6,314	-27.3	43	29	6,420	-24.1	38	30	6,446	-22.5	
400---	24	7,607	-17.9		30	7,520	-21.6	31	29	7,118	-32.9	37	30	7,266	-28.8	37	26	7,148	-33.7		29	7,262	-29.8		30	7,291	-29.0	
350---	24	8,591	-25.2		30	8,489	-28.6		29	8,044	-39.4		30	8,208	-35.5		26	8,090	-40.5		29	8,199	-36.9		30	8,230	-36.3	
300---	21	9,687	-33.7		30	9,574	-36.9		29	9,083	-46.3		30	9,262	-43.4		25	9,105	-47.2		28	9,250	-44.6		30	9,280	-44.1	
250---	20	10,939	-42.9		30	10,808	-46.6		27	10,273	-51.9		30	10,466	-51.0		24	10,293	-53.0		28	10,448	-52.4		30	10,480	-51.7	

# RADIOSONDE DATA

Average monthly values

Table 20--Continued

APRIL 1953

Standard pressure surface (mb.)	SAN JUAN, P. R. (1014 MB.)				SANTA MARIA, CALIF. (1007 MB.)				S. STE. MARIE, MICH. ( 984 MB.)				SPOKANE, WASH. ( 929 MB.)				SWAN ISLAND, W. I. (1011 MB.)				TACUBAYA, MEXICO ( 772 MB.)				TAMPA, FLA. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	19	24.7	79	30	71	10.7	83	30	221	1.4	81	30	722	8.9	51	30	10	26.5	80	29	2,306	19.9	39	30	9	19.9	81
1,000----	30	144	24.0	77	30	130	10.3	82	30	87			30	104			30	109	25.7	86	29	7		30	131	20.4	74	
950-----	30	599	21.0	79	30	564	10.4	69	30	508	- 1.4	74	30	537			30	564	22.2	79	29	476		30	577	18.6	65	
900-----	30	1,058	18.0	76	30	1,007	10.5	53	30	935	- 1.0	71	30	982	7.5	49	30	1,029	20.4	65	29	960		30	1,036	16.5	57	
850-----	30	1,546	15.3	69	30	1,481	8.3	48	30	1,389	- 3.6	70	30	1,450	3.8	52	30	1,521	18.4	48	29	1,482		30	1,520	14.1	52	
800-----	30	2,058	13.0	54	30	1,979	5.8	39	30	1,865	- 6.0	66	30	1,939	- 4.3	58	30	2,039	16.2	37	29	2,002		30	2,029	11.9	40	
750-----	30	2,607	10.6	46	30	2,507	2.9	34	30	2,370	- 8.4	63	30	2,457	- 4.3	63	30	2,591	13.5	30	29	2,560	18.5	35	30	2,579	9.1	36
700-----	30	3,170	8.0	35	30	3,059	- .2		30	2,901	-10.9	60	30	2,991	- 8.1	66	30	3,162	10.6	21	29	3,143	14.0	37	30	3,135	6.0	32
650-----	30	3,790	5.3		30	3,654	- 3.4	30	30	3,472	-13.9	56	30	3,570	-11.9	65	30	3,779	6.8	20	29	3,769	9.1	42	30	3,741	2.8	
600-----	30	4,429	2.3		30	4,277	- 6.9		30	4,070	-17.3	54	30	4,171	-15.4	61	30	4,427	3.0		29	4,421	3.7	48	30	4,382	- 1.2	
550-----	30	5,128	- 1.5		30	4,951	-11.3		30	4,720	-21.4	54	30	4,828	-19.5	61	30	5,127	- 1.3		29	5,122	- 1.9	53	30	5,069	- 6.2	
500-----	30	5,878	- 6.2		30	5,675	-16.4	29	30	5,413	-26.1	52	30	5,525	-24.2	60	30	5,879	- 5.9		29	5,872	- 7.3	51	30	5,808	-11.0	
450-----	30	6,705	-11.6		30	6,465	-22.4	30	30	6,172	-31.3	49	30	6,292	-29.4	54	30	6,701	-11.1		29	6,695	-12.3	40	29	6,618	-16.5	
400-----	30	7,586	-18.5		29	7,309	-29.0		30	6,993	-36.8	50	30	7,118	-35.2	49	30	7,590	-17.4		29	7,577	-17.9	35	28	7,488	-22.6	
350-----	30	8,567	-25.8		29	8,249	-36.4		30	7,906	-42.5		28	8,027	-42.2		30	8,575	-24.7		29	8,562	-24.9	28	8,453	-29.6		
300-----	30	9,663	-34.5		29	9,299	-44.1		30	8,933	-48.3		28	9,051	-49.2		28	9,677	-33.1		28	9,664	-33.2	28	9,533	-37.8		
250-----	30	10,910	-44.3		29	10,497	-52.7		30	10,124	-50.6		28	10,230	-54.2		28	10,931	-42.9		26	10,922	-43.1	28	10,764	-47.1		
200-----	30	12,367	-55.3		29	11,914	-58.0		29	11,588	-49.2		27	11,648	-54.6		28	12,397	-54.3		22	12,394	-54.5	27	12,206	-57.5		
175-----	30	13,207	-61.2		29	12,753	-58.9		28	12,465	-49.9		27	12,503	-53.5		28	13,239	-60.7		21	13,234	-60.7	26	13,037	-61.6		
150-----	30	14,150	-66.9		29	13,719	-58.8		28	13,472	-50.1		26	13,489	-52.7		28	14,182	-67.3		20	14,182	-66.8	26	13,983	-64.9		
125-----	30	15,233	-72.8		29	14,659	-60.5		28	14,659	-51.3		26	14,664	-53.4		26	15,262	-73.3		19	15,268	-71.8	26	15,085	-67.9		
100-----	28	16,525	-77.2		29	16,240	-62.7		26	16,101	-53.2		26	16,096	-54.1		21	16,552	-77.6		15	16,572	-75.8	24	16,412	-69.5		
80-----	25	17,807	-75.8		27	17,607	-62.0		26	17,533	-53.9		24	17,536	-55.0		15	17,826	-77.5		12	17,847	-75.9	21	17,740	-69.9		
60-----	20	19,501	-67.7		24	19,403	-59.5		25	19,373	-54.6		18	19,367	-54.1		11	19,508	-70.0		9	19,535	-69.7	20	19,468	-65.7		
50-----	19	20,614	-61.2		22	20,548	-57.4		23	20,539	-54.4		11	20,522	-53.5		11	20,604	-64.6		7	20,636	-64.2	18	20,580	-62.1		
40-----	17	22,015	-56.4		15	21,968	-55.3		19	21,961	-54.5		9	21,976	-53.0		11	21,979	-60.3		5	22,020	-59.6	16	21,978	-57.0		
30-----	7	23,870	-51.0		8	23,814	-52.4		8	23,829	-53.6		6	23,842	-53.0		10	23,798	-54.2		5	23,838	-54.9	12	23,817	-53.0		
20-----																	6	26,428	-49.1									

Standard pressure surface (mb.)	TATOOSH ISLAND, WASH. (1011 MB.)				VERACRUZ, MEXICO (1006 MB.)				WASHINGTON, D. C. (1001 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	29	31	8.0	81	30	13	26.9	82	30	88	10.9	61
1,000----	29	123	7.5	78	30	62	26.4	83	30	95	10.7	51
950----	29	546	5.2	75	30	518	26.5	67	30	524	10.6	59
900-----	29	984	2.0	76	30	993	24.6	58	30	972	8.2	60
850-----	29	1,442	- 1.1	70	30	1,492	21.8	56	30	1,441	5.1	62
800-----	29	1,924	- 3.7	60	30	2,017	19.2	52	30	1,934	2.2	63
750-----	29	2,438	- 6.3	56	30	2,573	16.2	45	30	2,458	- .8	60
700-----	29	2,968	- 9.1	57	30	3,152	12.4	43	30	3,000	- 3.9	60
650-----	29	3,543	-12.2	52	30	3,775	8.6	42	30	3,587	- 7.0	54
600-----	29	4,146	-15.6	50	30	4,427	3.8	41	30	4,202	-10.0	45
550-----	28	4,798	-20.1	49	28	5,129	- 1.3	38	30	4,873	-13.9	41
500-----	28	5,496	-25.1	49	26	5,881	- 6.6	36	30	5,585	-18.7	39
450-----	28	6,260	-30.5	48	25	6,703	-12.2		30	6,373	-24.3	38
400-----	28	7,080	-36.3		23	7,587	-18.3		30	7,210	-30.7	39
350-----	28	7,992	-43.3		21	8,571	-25.0		30	8,144	-37.0	
300-----	28	9,012	-50.0		20	9,673	-33.3		30	9,194	-43.7	
250-----	28	10,189	-54.4		18	10,928	-43.1		29	10,399	-50.7	
200-----	25	11,597	-54.2		16	12,399	-54.3		29	11,836	-54.3	
175-----	25	12,456	-52.6		16	13,243	-60.4		28	12,687	-55.4	
150-----	24	13,453	-52.6		13	14,193	-66.5		28	13,666	-56.2	
125-----	22	14,628	-54.0		13	15,280	-72.3		28	14,822	-56.0	
100-----	19	16,045	-54.1		10	16,569	-76.7		28	16,234	-57.7	
80-----	16	17,475	-54.5						27	17,636	-58.5	
60-----	8	19,288	-53.3						26	19,445	-57.7	
50-----									25	20,597	-56.9	
40-----									24	22,014	-55.9	
30-----									21	23,846	-54.4	
20-----									15	26,461	-51.7	
15-----									11	28,351	-48.6	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and

expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.



# PILOT BALLOON DATA

Average monthly resultant winds

APRIL 1953

Table 21

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction
	Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed	
Surface	30	225	1.9	30	253	4.0	28	344	4.4	26	327	2.3	30	318	2.6	30	116	4.3	29	244	3.9	28	298	1.8	30	222	3.6	27	240	3.8	29	248	5.2	30	293	1.7
500	30	235	2.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,000	29	237	3.5	---	---	---	28	336	3.4	24	334	2.9	30	313	2.5	24	151	2.1	27	253	6.0	23	265	4.4	29	235	5.2	26	235	6.3	6.0	---	---	---	---	
1,500	28	244	6.0	30	263	5.1	26	308	3.4	18	309	2.3	23	259	2.0	15	263	6.8	16	279	5.5	10	274	6.1	25	277	10.4	12	255	9.7	29	256	6.4	30	284	1.8
2,000	27	256	9.1	28	275	5.9	19	278	5.7	14	305	4.6	21	247	3.0	12	245	8.5	13	285	6.5	10	282	7.5	23	280	12.4	10	274	11.8	25	254	7.6	30	298	2.8
2,500	27	263	10.3	26	272	7.3	14	277	8.9	11	304	7.8	19	274	4.5	12	240	10.3	12	279	7.6				20	287	14.0				25	254	9.8	29	281	3.2
3,000	26	271	15.6	21	272	10.3			11	287	13.2		16	282	8.2										18	282	19.2				24	262	13.9	19	271	6.4
4,000	23	268	20.0	18	278	15.4							14	280	10.7										14	279	21.9				23	264	14.9	15	276	9.4
5,000	22	272	21.0	15	291	15.9							11	283	12.9										10	284	20.8				19	266	17.3	10	293	12.2
6,000	12	288	20.9	13	290	22.7							10	288	19.7																15	267	20.6			
8,000				11	280	25.6																									12	260	22.1			
10,000																															11	261	27.7			
12,000																																				

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)			Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)		
	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction
	Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed	
Surface	30	274	2.8	27	300	2.7	28	254	3.9	27	360	1.5	30	180	1.1	29	209	0.7	30	336	1.5	30	150	3.1	27	203	1.7	29	250	2.4	29	265	4.7	28	205	2.1
500	---	---	---	27	296	3.1	28	251	4.9	27	---	---	29	216	3.0	29	212	2.4	30	330	1.6	30	174	3.1	27	214	3.0	28	229	4.0	29	274	4.0	28	218	2.3
1,000	---	---	---	24	294	2.7	28	252	6.0	27	---	---	29	237	5.3	27	236	4.8	30	287	1.9	29	211	3.3	25	241	2.7	26	235	5.2	25	287	2.2	26	230	3.9
1,500	30	274	2.7	20	287	3.2	28	259	6.9	23	328	1.6	26	256	6.3	23	250	7.6	29	239	2.4	27	243	5.1	21	285	4.6	26	237	7.3	23	303	2.3	23	246	5.6
2,000	30	281	4.3	18	291	3.2	22	263	9.2	17	286	2.8	26	263	8.8	20	258	11.8	26	239	3.5	24	257	6.4	20	289	7.5	21	257	9.0	24	305	3.7	22	260	7.9
2,500	29	279	4.5	12	290	6.1	20	275	13.1	13	270	3.9	22	275	9.2	18	273	14.9	22	249	4.4	23	266	7.6	18	288	8.8	20	266	12.6	23	315	5.2	21	266	12.3
3,000	27	264	5.2	11	303	10.3	17	286	17.0	11	280	6.2	22	280	11.2	17	274	16.0	21	262	5.0	23	265	9.1	17	283	10.5	19	268	16.0	23	302	6.7	21	276	14.6
4,000	20	267	7.0				16	278	18.7				21	275	14.8	12	271	18.8	13	278	8.5	17	277	10.0	11	285	13.6	15	278	18.1	21	299	9.3	21	272	18.1
5,000	16	285	12.4				13	286	21.2				18	279	17.9				12	290	10.2	14	274	11.2				12	279	21.0	19	292	12.4	20	277	21.9
6,000	10	284	16.7										18	277	21.5				11	295	12.9	13	274	13.4				10	290	21.8	19	294	16.7	14	274	27.0
8,000													10	281	20.1																					

Altitude (meters) m.s.l.	Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (725 m.)			Washington, D. C. (24 m.)				
	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction	No. of observations		Direction		
	Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed		Speed	Speed
Surface	29	330	2.4	30	254	2.8	27	353	3.8	25	336	1.9	26	252	3.0	30	135	1.8	30	253	3.6	23	304	3.1	29	231	3.6	30	226	1.8	30	262	2.0		
500	29	324	2.5	30	252	3.8	---	---	---	25	331	3.0	26	250	4.4	30	154	1.7	26	265	3.4	23	303	3.3	29	220	4.1	---	---	---	29	258	3.9		
1,000	22	346	1.0	30	250	4.3	27	354	3.9	21	353	2.3	22	248	5.6	29	171	1.6	23	263	2.5	19	289	3.7	25	204	4.4	30	223	2.7	29	251	6.6		
1,500	18	259	.6	30	232	4.5	25	339	4.8	15	312	4.0	21	248	7.0	26	227	2.7	20	268	2.7	15	292	2.8	19	187	4.2	29	217	2.7	29	254	9.0		
2,000	13	239	3.9	30	226	4.6	18	316	4.2	12	327	5.3	19	268	10.6	23	249	5.5	20	273	4.0	14	299	4.5	15	185	5.1	24	235	3.5	29	261	11.7		
2,500	12	272	9.1	30	244	4.3	13	285	5.3				16	275	11.2	21	258	8.7	18	277	4.6	13	299	6.8	13	195	4.2	21	246	3.8	29	268	13.0		
3,000	11	280	11.7	29	265	6.1	12	300	7.8				10	272	12.9	21	261	11.4	17	274	5.6	12	304	7.5	12	203	3.0	20	259	5.3	29	266	14.9		
4,000				27	268	11.2							20	264	15.8	15	268	11.7	10	303	11.3	11	256	5.5	10	272	7.9				30	264	19.4		
5,000	10	283	12.9	21	275	11.3							18	269	19.3	14	269	13.2													30	265	20.9		
6,000				16	286	12.4							17	273	20.6	12	274	14.1													28	263	35.6		
8,000				11	289	13.3										10	269	15.6													28	269	35.4		
10,000																															27	274	29.0		
12,000																																			
14,000																																			
16,000																																			

\* 18,000 m., 25 obs., 272 dir., 8.0 speed  
 20,000 m., 25 obs., 278 dir., 3.8 speed  
 22,000 m., 23 obs., 271 dir., 3.6 speed  
 24,000 m., 21 obs., 284 dir., 2.7 speed  
 26,000 m., 19 obs., 267 dir., 5.4 speed  
 28,000 m., 14 obs., 281 dir., 9.0 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N

# RAWIN DATA

Average monthly resultant winds

Table 22

APRIL 1953

Altitude (meters) m.a.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			Int. Falls, Minn. (358 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed				
Surface	30	298	1.6	30	165	2.7	30	39	2.5	30	112	4.9	30	161	2.4	30	311	1.3	30	210	2.6	30	313	0.7	30	360	0.9	29	250	1.5	29	228	3.8	30	8	2.0
500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,000	---	---	---	30	186	3.9	29	35	3.3	29	123	6.8	30	168	3.8	30	282	2.5	28	235	8.7	30	265	2.0	---	---	---	29	252	4.5	24	243	7.3	30	19	3.4
1,500	---	---	---	30	233	5.4	29	3	2.4	29	131	3.3	30	201	2.8	30	290	2.9	28	252	9.2	30	267	4.0	---	---	---	29	258	7.9	22	258	8.1	30	25	4.6
2,000	30	283	6.2	30	248	7.7	28	328	2.9	29	197	1.4	30	229	3.6	30	292	2.9	29	266	9.0	30	268	5.2	30	348	8	29	264	9.6	25	268	10.8	30	14	4.6
2,500	30	276	8.2	30	258	10.3	27	324	5.1	29	246	3.7	29	252	5.6	29	245	2.6	29	271	9.5	30	269	7.5	30	281	2.3	29	267	11.0	25	276	11.2	30	5	3.1
3,000	29	270	9.1	30	259	12.3	26	321	6.6	29	259	6.6	27	264	10.0	29	236	3.5	29	279	10.1	30	270	9.1	30	278	4.5	29	272	12.7	25	281	12.9	30	356	3.5
4,000	29	265	11.6	28	266	15.1	25	308	9.2	27	262	12.8	26	267	14.3	29	234	6.6	25	279	13.5	28	278	13.5	30	276	7.8	28	277	16.9	23	281	17.9	30	336	4.3
5,000	28	274	12.8	27	266	17.5	25	303	10.9	25	269	15.4	26	263	17.4	29	241	8.0	24	279	18.2	27	277	16.2	30	284	10.1	26	274	18.4	20	286	18.5	29	313	4.8
6,000	27	276	15.9	26	269	20.7	24	306	12.9	22	267	19.0	26	267	20.6	29	243	9.0	21	278	18.7	27	278	18.8	30	289	12.1	23	280	19.3	18	284	18.6	29	295	8.2
8,000	19	269	15.1	17	266	22.4	19	284	13.7	18	269	24.7	21	268	25.5	27	243	12.5	16	280	23.7	21	276	22.2	26	279	14.8	16	280	23.9	13	284	25.3	26	285	12.2
10,000	16	270	17.7	11	269	23.3	16	293	14.0	14	263	33.2	13	263	32.5	23	236	13.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12,000	13	272	18.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
14,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
16,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
18,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
20,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	

Altitude (meters) m.a.l.	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P.R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed	
Surface	30	220	0.9	30	309	1.9	30	139	2.3	28	263	1.7	30	253	1.1	30	269	3.6	30	78	1.7	30	354	3.2	30	96	2.8	30	108	2.3	29	332	1.2	30	273	2.7
500	30	229	4.2	30	303	2.1	30	152	2.6	25	276	5.8	30	239	3.0	30	284	5.0	29	96	1.7	---	---	---	30	120	4.8	30	104	5.1	27	332	2.0	30	319	4.4
1,000	30	238	6.4	30	289	2.8	30	211	1.7	25	278	6.9	30	240	6.6	30	290	4.8	29	195	1.5	29	0	3.1	30	155	4.2	30	97	4.4	26	327	3.0	30	338	5.3
1,500	29	246	7.6	30	268	2.3	30	241	3.6	25	279	8.2	30	249	8.3	30	294	4.4	29	262	4.6	28	347	3.6	30	217	4.9	30	87	3.6	25	338	3.2	30	350	4.9
2,000	29	259	10.2	30	243	3.2	30	250	5.6	24	277	8.8	29	258	11.0	30	302	4.8	30	279	7.5	28	324	4.4	30	241	7.2	30	79	3.3	24	326	2.7	30	339	5.0
2,500	25	269	12.6	30	254	4.5	30	258	6.4	24	273	10.8	28	267	12.9	30	294	4.8	28	278	9.9	29	307	6.2	30	255	8.9	30	76	2.7	24	323	4.1	30	316	5.9
3,000	24	279	15.5	30	251	6.1	30	259	8.1	25	268	11.9	28	263	14.9	30	289	5.1	28	278	12.8	29	306	8.0	30	261	12.1	30	55	2.3	25	310	4.9	30	304	8.2
4,000	22	277	18.0	29	280	9.4	30	273	10.1	22	274	14.3	26	264	16.3	30	294	8.8	25	267	15.6	29	303	10.5	29	266	13.9	30	14	2.2	27	312	8.7	30	297	11.1
5,000	13	282	19.9	29	276	12.2	30	274	13.2	22	259	13.6	26	267	21.0	28	300	12.7	25	271	17.7	28	292	12.2	27	274	15.1	30	338	3.2	26	303	11.5	28	292	12.8
6,000	11	286	21.5	26	278	11.8	30	272	16.8	19	264	13.2	22	271	24.7	27	298	16.7	25	269	20.1	27	283	13.1	24	271	17.9	30	315	5.7	25	290	11.2	22	286	12.0
8,000	---	---	---	19	268	12.2	29	279	23.2	17	260	17.7	15	266	29.1	17	289	12.7	20	261	23.3	25	273	16.5	19	271	20.3	30	304	11.1	22	292	13.4	17	290	11.8
10,000	---	---	---	15	262	13.7	23	278	27.2	13	256	22.6	---	---	---	12	301	13.4	14	257	24.0	17	265	16.2	13	264	29.6	30	294	19.4	18	271	13.3	14	278	11.3
12,000	---	---	---	11	268	16.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
16,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
18,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
20,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m.a.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			* Washington, D.C. (88 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed	
Surface	29	297	1.2	30	197	1.2	29	208	2.3	30	279	1.3
500	29	329	1.4	---	---	---	29	222	2.9	30	286	5.6
1,000	29	13	2.1	29	225	1.4	29	216	3.3	30	280	9.6
1,500	28	324	1.6	29	245	2.6	28	211	3.3	30	271	11.7
2,000	26	318	1.4	29	256	3.1	28	212	3.5	30	269	12.8
2,500	26	325	2.8	30	251	3.8	28	222	4.3	30	267	13.3
3,000	26	311	3.7	30	262	3.8	28	226	4.4	30	270	14.9
4,000	26	296	5.7	30	271	5.8	26	239	6.6	30	272	18.4
5,000	25	296	9.2	30	284	7.4	25	250	6.6	30	271	21.1
6,000	25	290	12.0	28	278	9.0	23	240	5.3	30	272	24.0
8,000	22	275	17.3	22	260	9.4	20	225	7.9	29	266	30.0
10,000	12	266	15.1	18	259	7.7	14	276	9.9	29	265	37.2
12,000	---	---	---	16	258	9.7	13	277	9.4	27	268	32.9
14,000	---	---	---	14	278	8.1	11	286	8.8	26	268	28.6
16,000	---	---	---	14	268	4.5	10	277	5.3	24	263	9.5
18,000	---	---	---	13	286	3.8	---	---	---	---	---	---



# SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun.

APRIL 1953

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
ALBUQUERQUE, N. MEX.									
	Air mass								
	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08
April 1-----	0.82	0.91	1.02	1.10	----	1.12	0.92	0.82	0.71
2-----	.69	.80	.92	1.11	----	1.10	-----	-----	-----
3-----	-----	-----	.42	.70	----	-----	-----	-----	-----
4-----	-----	-----	.92	-----	----	-----	-----	-----	-----
5-----	.69	.81	.92	-----	----	1.02	.95	-----	-----
6-----	.65	.73	.85	1.02	----	-----	-----	-----	-----
7-----	-----	-----	-----	-----	----	-----	.35	-----	-----
8-----	.65	.94	1.09	1.21	----	-----	-----	-----	-----
9-----	.61	.73	.88	1.05	----	.51	-----	-----	-----
10-----	.72	.82	.92	1.10	----	.51	-----	-----	-----
11-----	-----	-----	-----	1.08	----	1.12	.99	.88	.80
12-----	.78	.87	1.00	1.16	----	-----	-----	-----	-----
14-----	.83	.94	1.11	1.29	----	1.23	1.16	.99	-----
15-----	.97	1.05	1.19	1.38	----	1.36	1.16	1.00	.90
16-----	.94	1.05	1.20	1.38	----	-----	-----	-----	-----
17-----	.90	1.02	1.16	1.31	----	-----	-----	-----	-----
18-----	-----	-----	-----	-----	----	1.29	1.11	.93	.89
19-----	.80	.92	1.07	1.27	----	-----	-----	-----	.75
20-----	-----	-----	-----	1.05	----	-----	-----	-----	-----
22-----	-----	-----	.88	-----	----	-----	-----	-----	-----
24-----	.82	.94	1.09	1.29	----	1.29	1.06	.92	.78
25-----	1.03	1.12	1.24	1.40	----	-----	-----	-----	.97
26-----	-----	.86	1.05	1.30	----	-----	-----	-----	-----
27-----	.60	.77	.89	-----	----	-----	-----	-----	-----
28-----	-----	-----	-----	-----	----	-----	.91	-----	-----
29-----	-----	1.03	1.18	1.28	----	.84	.82	.75	.63
30-----	.91	.99	1.12	1.25	----	-----	-----	-----	-----
Aver- ages	.79	.97	1.01	1.17	----	1.09	1.01	.84	.79
Deper- tures	-.08	-.03	-.08	+.04	----	-.04	-.11	-.17	-.14
TABLE MOUNTAIN, CALIF.									
	Air mass								
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
April 18-----	-----	-----	-----	1.40	----	-----	-----	-----	-----
24-----	-----	-----	-----	1.39	----	-----	-----	-----	-----
Aver- ages	-----	-----	-----	1.40	----	-----	-----	-----	-----
Deper- tures	-----	-----	-----	-.01	----	-----	-----	-----	-----
MADISON, WIS.									
	Air mass								
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
NO DATA DURING APRIL 1953									

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
LINCOLN, NEBR.									
	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
April 1-----	-----	-----	0.94	1.14	----	-----	-----	-----	-----
3-----	-----	0.82	1.01	1.18	----	-----	-----	-----	-----
4-----	-----	.86	.99	1.16	----	-----	-----	-----	-----
10-----	-----	-----	.94	1.14	----	-----	-----	-----	-----
13-----	-----	-----	.90	1.11	----	-----	-----	-----	-----
18-----	-----	-----	-----	1.18	----	-----	-----	-----	-----
Aver- ages	-----	.84	.96	1.15	----	-----	-----	-----	-----
Deper- tures	-----	.00	-.01	-.02	----	-----	-----	-----	-----
BOSTON, MASS.									
	Air mass								
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
April 15-----	-----	-----	-----	-----	----	-----	1.07	-----	-----
Aver- ages	-----	-----	-----	-----	----	-----	1.07	-----	-----
Deper- tures	-----	-----	-----	-----	----	-----	+.06	-----	-----
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
April 3-----	0.86	0.90	1.05	1.24	----	-----	1.17	0.99	0.84
4-----	-----	-----	-----	-----	----	-----	1.11	.89	.79
15-----	.81	.93	1.10	1.21	----	-----	1.30	1.14	1.03
22-----	.74	.86	1.00	1.21	----	-----	-----	-----	-----
24-----	-----	-----	-----	1.15	----	-----	1.21	-----	-----
Aver- ages	.78	.90	1.05	1.21	----	-----	1.20	1.01	.89
Deper- tures	.00	+.02	+.03	+.03	----	-----	+.06	+.05	+.07
* Extrapolated									

Langley is the unit used to denote one gram caloric per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
LINCOLN, NEBR.									
	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
April 1-----	-----	-----	0.94	1.14	-----	-----	-----	-----	-----
3-----	-----	0.82	1.01	1.18	-----	-----	-----	-----	-----
4-----	-----	.86	.99	1.16	-----	-----	-----	-----	-----
10-----	-----	-----	.94	1.14	-----	-----	-----	-----	-----
13-----	-----	-----	.90	1.11	-----	-----	-----	-----	-----
18-----	-----	-----	-----	1.18	-----	-----	-----	-----	-----
Aver- ages	-----	.84	.96	1.15	-----	-----	-----	-----	-----
Deper- tures	-----	.00	-.01	-.02	-----	-----	-----	-----	-----
BOSTON, MASS.									
	Air mass								
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
April 15-----	-----	-----	-----	-----	-----	1.07	-----	-----	-----
Aver- ages	-----	-----	-----	-----	-----	1.07	-----	-----	-----
Deper- tures	-----	-----	-----	-----	-----	+.06	-----	-----	-----
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
April 3-----	0.86	0.90	1.05	1.24	-----	1.17	0.99	0.84	0.78
4-----	-----	-----	-----	-----	-----	1.11	.89	.79	.67
15-----	.81	.93	1.10	1.21	-----	1.30	1.14	1.03	.89
22-----	.74	.86	1.00	1.21	-----	-----	-----	-----	-----
24-----	-----	-----	-----	1.15	-----	1.21	-----	-----	-----
Aver- ages	.78	.90	1.05	1.21	-----	1.20	1.01	.89	.78
Deper- tures	.00	+.02	+.03	+.03	-----	+.06	+.05	+.07	+.08

\* Extrapolated

pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

# SOLAR RADIATION DATA

April 1953

**Table 31a** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

	2	3	4	5	6	7	8	Avg	9	10	11	12	13	14	15	Avg	16	17	18	19	20	21	22	Avg
Date																								
Langleys	55	77	86	42	110	30	83	69	99	57	97	87	22	125	140	89	60	90	56	30	93	107	101	77
Date	23	24	25	26	27	28	29		30	May 1	2	3	4	5	6									
Langleys	97	98	49	44	66	125	122	86	118	20	20	110	113	49	129	80								

**Table 31b** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

	2	3	4	5	6	7	8	Avg	9	10	11	12	13	14	15	Avg	16	17	18	19	20	21	22	Avg
Date																								
Langleys	57	354	328	45	346	36	107	182	255	72	129	124	29	144	452	172	123	385	60	42	109	341	420	211
Date	23	24	25	26	27	28	29		30	1	2	3	4	5	6									
Langleys	196	389	61	68	80	261	415	210	393	24	27	107	394	46	300	184								

**Table 31c** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

	2	3	4	5	6	7	8	Avg	9	10	11	12	13	14	15	Avg	16	17	18	19	20	21	22	Avg
Date																								
Langleys	56	444	416	49	339	36	261	229	363	58	225	99	22	138	440	192	50	346	49	30	139	271	319	172
Date	23	24	25	26	27	28	29		30	1	2	3	4	5	6									
Langleys	210	335	44	56	71	169	263	164	308	21	19	151	286	43	277	158								

**Table 31d** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

	2	3	4	5	6	7	8	Avg	9	10	11	12	13	14	15	Avg	16	17	18	19	20	21	22	Avg
Date																								
Langleys	61	360	352	53	216	36	336	202	273	59	347	89	25	236	477	215	59	220	66	42	263	405	294	193
Date	23	24	25	26	27	28	29		30	1	2	3	4	5	6									
Langleys	429	419	64	66	96	202	425	243	367	26	28	318	379	63	301	212								

**Table 31e** Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

	2	3	4	5	6	7	8	Avg	9	10	11	12	13	14	15	Avg	16	17	18	19	20	21	22	Avg
Date																								
Langleys	107	80	103	80	201	70	168	116	196	115	177	166	53	173	99	140	92	110	103	60	182	174	138	123
Date	23	24	25	26	27	28	29		30	1	2	3	4	5	6									
Langleys	159	89	90	86	130	216	123	127	124	36	39	192	88	74	254	115								

Note: Langley is the unit used to denote one gram calorie per square centimeter.



# SOLAR RADIATION DATA

Table 33—Daily total and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langley-inches. —Continued

APRIL 1953

1953	Lake Charles, La.	Lander, Wyo.	Las Vegas, Nev.	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBAC)	Madison, Wis.	Medford, Ore.	Miami, Fla.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Portland, Me.	Put-in-Bay, Ohio	Rapid City, S. Dak.	Riverside, Calif.	Salt Lake City, Utah	San Antonio, Tex.	Santa Maria, Calif.	S. Ste. Marie, Mich.	Saville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (U. of W.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Is., B. W. I.	Tampa, Fla.	Washington, D. C. (Amer. U.)	Washington, D. C. (WBAC)	
April 2	156	673	695	59	539	514	518	518	595	682	153	128	166	214	618	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
April 3	156	638	682	469	279	509	518	518	567	682	604	587	511	559	630	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
April 4	156	638	682	469	279	509	518	518	567	682	604	587	511	559	630	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
April 5	156	638	682	469	279	509	518	518	567	682	604	587	511	559	630	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
April 6	156	638	682	469	279	509	518	518	567	682	604	587	511	559	630	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
April 7	156	638	682	469	279	509	518	518	567	682	604	587	511	559	630	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
April 8	156	638	682	469	279	509	518	518	567	682	604	587	511	559	630	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
April 9	156	638	682	469	279	509	518	518	567	682	604	587	511	559	630	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
April 10	156	638	682	469	279	509	518	518	567	682	604	587	511	559	630	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
April 11	156	638	682	469	279	509	518	518	567	682	604	587	511	559	630	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
April 12	156	638	682	469	279	509	518	518	567	682	604	587	511	559	630	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
April 13	156	638	682	469	279	509	518	518	567	682	604	587	511	559	630	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
April 14	156	638	682	469	279	509	518	518	567	682	604	587	511	559	630	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
April 15	156	638	682	469	279	509	518	518	567	682	604	587	511	559	630	592	666	167	494	388	549	567	313	197	517	161	133	80	462	477	204	583	634	407	263	239	
Averages	388	503	691	367	384	478	409	327	493	579	411	329	347	375	438	398	642	376	409	403	394	440	456	474	435	440	412	255	309	240	261	336	383	593	538	326	359
Departures	---	---	---	-22	---	---	---	-43	---	---	+1	-59	+2	---	---	---	---	---	---	---	-60	---	---	---	---	---	---	---	---	---	-13	---	---	---	-49	---	
April 16	392	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
April 17	392	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
April 18	392	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
April 19	392	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
April 20	392	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
April 21	392	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
April 22	392	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
Averages	552	658	681	348	489	692	(618)	334	553	(543)	(468)	285	292	426	608	434	699	427	357	436	601	443	584	(576)	352	353	255	338	337	382	367	510	624	537	387	388	---
Departures	---	---	---	-59	---	---	---	-64	---	---	-22	-117	-60	---	---	---	---	---	---	---	-113	---	---	---	---	---	---	---	---	---	-5	---	---	---	-42	---	
April 23	393	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
April 24	393	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
April 25	393	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
April 26	393	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
April 27	393	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
April 28	393	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
April 29	393	581	705	75	402	721	666	---	403	529	516	53	195	524	626	417	714	580	517	218	513	655	143	614	591	174	407	385	279	379	462	419	603	618	285	322	---
Averages	419	553	709	348	465	466	(300)	282	(500)	636	438	274	484	394	572	335	688	416	331	417	356	504	558	467	426	467	404	467	404	467	404	420	498	625	645	472	528
Departures	---	---	---	-75	---	---	---	-149	---	---	-6	-166	+49	---	---	---	---	---	---	---	-103	---	---	---	---	---	---	---	---	---	+16	---	---	---	+32	---	
April 30	405	581	705	132	626	---	666	169	(455)	731	378	491	218	614	651	92	755	171	509	154	715	643	645	704	93	245	69	389	497	623	440	653	699	606	622	337	338
May 1	405	581	705	132	626	---	666	169	(455)	731	378	491	218	614	651	92	755	171	509	154	715	643	645	704	93	245	69	389	497	623	440	653	699	606	622	337	338
May 2	405	581	705	132	626	---	666	169	(455)	731	378	491	218	614	651	92	755	171	509	154	715	643	645	704	93	245	69	389	497	623	440	653	699	606	622	337	338
May 3	405	581	705	132	626	---	666	169	(455)	731	378	491	218	614	651	92	755	171	509	154	715	643	645	704	93	245	69	389	497	623	440	653	699	606	622	337	338
May 4	405	581	705	132	626	---	666	169	(455)	731	378	491	218	614	651	92	755	171	509	154	715	643	645	704	93	245	69	389	497	623	440	653	699	606	622	337	338
May 5	405	581	705	132	626	---	666	169	(455)	731	378	491	218	614	651	92	755	171	509	154	715	643	645	704	93	245	69	389	497	623	440	653	699	606			

# SOLAR RADIATION DATA

APRIL 1953

**Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langley's.**

	Albuquerque, N. Mex.	Alachicola, Fla.	Alta, Ga.	Borrow, Alaska	Bethel, Alaska	Big Spring, Tex.	Bismarck, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Island	Caribou, Me.	Charleston, S. C.	Cleveland, Ohio	Columbia, Mo.	Columbus, Ohio	Davis, Calif.	Dodge City, Kans.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	ELY, Nev.	Fairbanks, Alaska	Fl. Worth, Tex.	Fresno, Calif.	Glascow, Mont.	Grand Junction, Colo.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	
1953																																				
April 2	605	223	442	338	442	119	396	137	508	480	656	218	546	625	(392)	139	473	692	659	324	665	633	543	504	466	398	625	630	262	638	449					
April 3	670	500	353	294	353	496	479	591	297	521	377	530	690	(228)	540	435	408	656	656	350	246	644	635	682	466	625	630	262	638	449						
April 4	618	500	353	294	353	496	479	591	297	521	377	530	690	(228)	540	435	408	656	656	350	246	644	635	682	466	625	630	262	638	449						
April 5	618	500	353	294	353	496	479	591	297	521	377	530	690	(228)	540	435	408	656	656	350	246	644	635	682	466	625	630	262	638	449						
April 6	618	500	353	294	353	496	479	591	297	521	377	530	690	(228)	540	435	408	656	656	350	246	644	635	682	466	625	630	262	638	449						
April 7	618	500	353	294	353	496	479	591	297	521	377	530	690	(228)	540	435	408	656	656	350	246	644	635	682	466	625	630	262	638	449						
April 8	618	500	353	294	353	496	479	591	297	521	377	530	690	(228)	540	435	408	656	656	350	246	644	635	682	466	625	630	262	638	449						
Averages	592	(472)	475	313	421	296	504	418	456	398	466	364	539	(526)	(293)	311	369	669	659	324	665	633	543	455	486	503	622	627	518	632	391	644	268	644	268	
Departures						20							+51		-8	-41				+37	(414)	(642)	430													
April 9	721	356	568	389	507	428	454	554	478	543	559	550	539	461	407	207	719	699	699	361	660	(657)	345	322	534	575	656	511	719	330	644	268	644	268		
April 10	721	356	568	389	507	428	454	554	478	543	559	550	539	461	407	207	719	699	699	361	660	(657)	345	322	534	575	656	511	719	330	644	268	644	268		
April 11	721	356	568	389	507	428	454	554	478	543	559	550	539	461	407	207	719	699	699	361	660	(657)	345	322	534	575	656	511	719	330	644	268	644	268		
April 12	721	356	568	389	507	428	454	554	478	543	559	550	539	461	407	207	719	699	699	361	660	(657)	345	322	534	575	656	511	719	330	644	268	644	268		
April 13	721	356	568	389	507	428	454	554	478	543	559	550	539	461	407	207	719	699	699	361	660	(657)	345	322	534	575	656	511	719	330	644	268	644	268		
April 14	721	356	568	389	507	428	454	554	478	543	559	550	539	461	407	207	719	699	699	361	660	(657)	345	322	534	575	656	511	719	330	644	268	644	268		
April 15	721	356	568	389	507	428	454	554	478	543	559	550	539	461	407	207	719	699	699	361	660	(657)	345	322	534	575	656	511	719	330	644	268	644	268		
Averages	(715)	(455)	553	403	526	470	562	514	329	549	356	374	532	568	(276)	292	394	734	734	608	(406)	(631)	(651)	436	471	475	532	584	424	664	279	684	279	684	279	
Departures						63							-10		-36	-94				-38			-97													
April 16	729	703	723	381	449	638	138	426	122	(332)	802	620	678	138		230	680	685	259	144			751	510	419	763	(653)	578	556	258	619	728	419	580	632	200
April 17	729	703	723	381	449	638	138	426	122	(332)	802	620	678	138		230	680	685	259	144			751	510	419	763	(653)	578	556	258	619	728	419	580	632	200
April 18	729	703	723	381	449	638	138	426	122	(332)	802	620	678	138		230	680	685	259	144			751	510	419	763	(653)	578	556	258	619	728	419	580	632	200
April 19	729	703	723	381	449	638	138	426	122	(332)	802	620	678	138		230	680	685	259	144			751	510	419	763	(653)	578	556	258	619	728	419	580	632	200
April 20	729	703	723	381	449	638	138	426	122	(332)	802	620	678	138		230	680	685	259	144			751	510	419	763	(653)	578	556	258	619	728	419	580	632	200
April 21	729	703	723	381	449	638	138	426	122	(332)	802	620	678	138		230	680	685	259	144			751	510	419	763	(653)	578	556	258	619	728	419	580	632	200
April 22	729	703	723	381	449	638	138	426	122	(332)	802	620	678	138		230	680	685	259	144			751	510	419	763	(653)	578	556	258	619	728	419	580	632	200
Averages	(634)	627	614	436	455	591	542	587	405	653	651	681	705	598	664	538	348	557	650	(671)	338	769	698	626	650	650	650	650	650	650	650	650	650	650	650	
Departures						69																														
April 23	150	689	623	498	400	517	266	470	674	416		736	142	689	623	312	296	659		449	302	347	355	742	520	75	732	210	377	171	476	579	703	654	735	520
April 24	150	689	623	498	400	517	266	470	674	416		736	142	689	623	312	296	659		449	302	347	355	742	520	75	732	210	377	171	476	579	703	654	735	520
April 25	150	689	623	498	400	517	266	470	674	416		736	142	689	623	312	296	659		449	302	347	355	742	520	75	732	210	377	171	476	579	703	654	735	520
April 26	150	689	623	498	400	517	266	470	674	416		736	142	689	623	312	296	659		449	302	347	355	742	520	75	732	210	377	171	476	579	703	654	735	520
April 27	150	689	623	498	400	517	266	470	674	416		736	142	689	623	312	296	659		449	302	347	355	742	520	75	732	210	377	171	476	579	703	654	735	520
April 28	150	689	623	498	400	517	266	470	674	416		736	142	689	623	312	296	659		449	302	347	355	742	520	75	732	210	377	171	476	579	703	654	735	520
April 29	150	689	623	498	400	517	266	470	674	416		736	142	689	623	312	296	659		449	302	347	355	742	520	75	732	210	377	171	476	579	703	654	735	520
Averages	606	562	602	462	416	507	340	360	518	302		686	(304)	613	351	392	283	545	606	266	316	307	603	591	496	524	599	406	571	501	566	589	696	348	668	384
Departures						82				62																										
April 30	713	303	182	514	473	612	473	677	478	597	689	750	481	360	318	512	212	573	762	777	544	119	692	367	567	(552)	(769)	564	322	649	88	86	368	744	445	
May 1	713	303	182	514	473	612	473	677	478	597	689	750	481	360	318	512	212	573	762	777	544	119	692	367	567	(552)	(769)	564	322	649	88	86	368	744	445	
May 2	713	303	182	514	473	612	473	677	478	597	689	750	481	360	318	512	212	573	762	777	544	119	692	367	567	(552)	(769)	564	322	649	88	86	368	744	445	
May 3	713	303	182	514	473	612	473	677	478	597	689	750	481	360	318	512	212	573	762	777	544	119	692	367	567	(552)	(769)	564	322	649	88	86	368	744	445	
May 4	713	303	182	514	473	612	473	677	478	597	689	750	481	360	318	512	212	573	762	777	544	119	692	367	567	(552)	(769)	564	322	649	88	86	368	744	445	
May 5	713	303	182	514	473	612	473	677	478	597	689	750	481	360	318	512	212	573	762	777	544	119	692	367	567	(552)	(769)	564	322	649	88	86	368	744	445	
May 6	713	303	182	514	473	612	473	677	478	597	689	750	481	360	318	512	212	573	762	777	544	119	692	367	567	(552)	(769)	564	322	649	88	86	368	744	445	
Averages																																				

Accumulated Departures January 1 to May 6, 1953

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.



### ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

Apr 11 1953

Station	Day of month																																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average		
Baltimore, Md.	343	169	580	268	---	---	126	468	275	317	628	151	82	453	544	---	634	123	386	409	---	---	---	---	---	---	---	---	---	---	---	---	---	350
Philadelphia, Pa.	178	66	421	211	450	271	40	307	185	73	588	156	58	475	---	291	526	111	326	485	574	307	480	---	333	376	334	451	332	273	---	---	310	
Pittsburgh, Pa.	144	142	307	358	386	86	180	462	---	---	388	119	124	391	284	65	278	---	---	231	398	411	500	296	244	235	99	258	512	233	---	---	274	
Washington, D.C. (WBCO)	508	265	596	335	646	219	138	540	369	421	677	187	106	581	587	518	722	120	478	441	602	663	502	619	618	651	---	600	652	397	---	---	474	

The illuminometer at Pittsburgh is located on the 10th story roof of the Post Office and Federal Courts Building, at Grant St., between Seventh and Liberty Avenues, 926 feet above mean sea level. Coordinates are 40° 27' North and 80° 00' West.

The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continu-

Exposure is in a narrow valley near the junction of the Allegheny and Monongahela Rivers. Smoke sources exist in every direction. The atmosphere is particularly polluted during periods of temperature inversions and with prevailing NW and SE winds.

ous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in Illuminating Engineering, Vol. XLVI No. 2, pages 59 to 62.

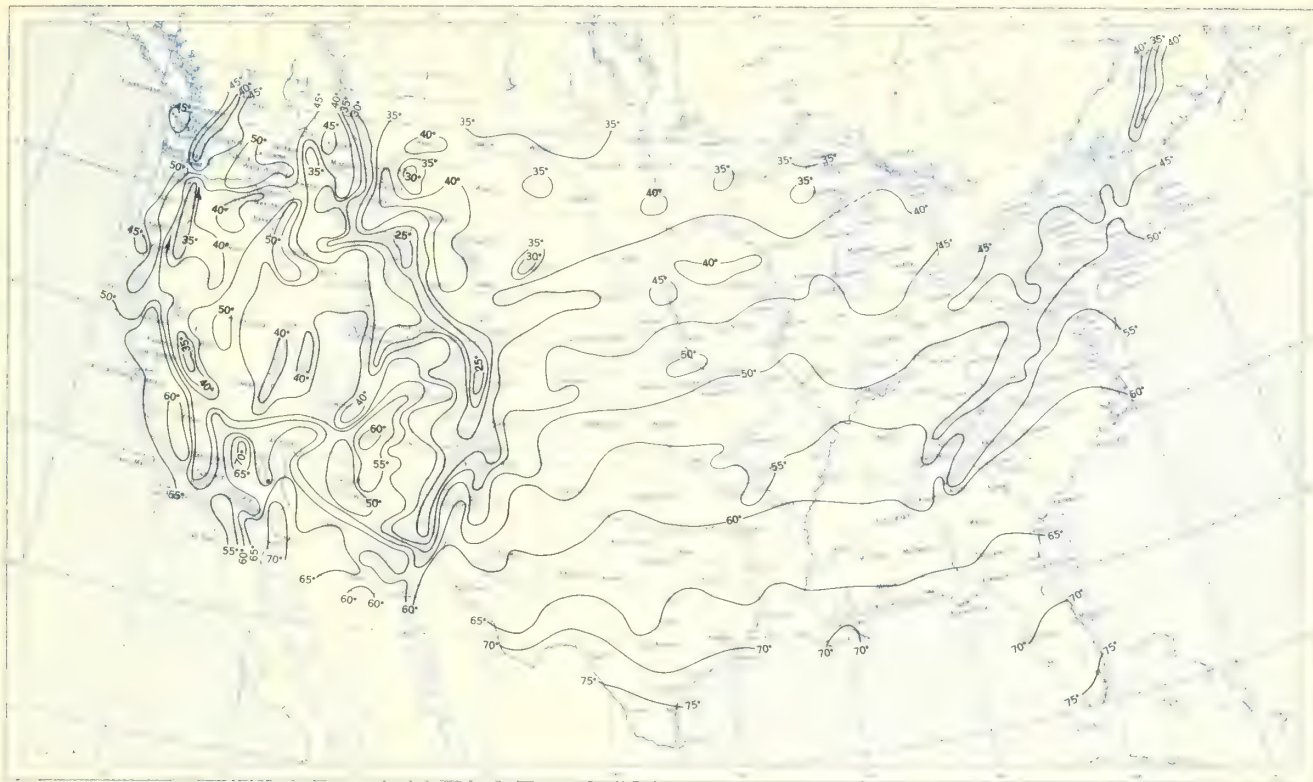
NWRC, Asheville, N.C. — 8/12/53 — 2200



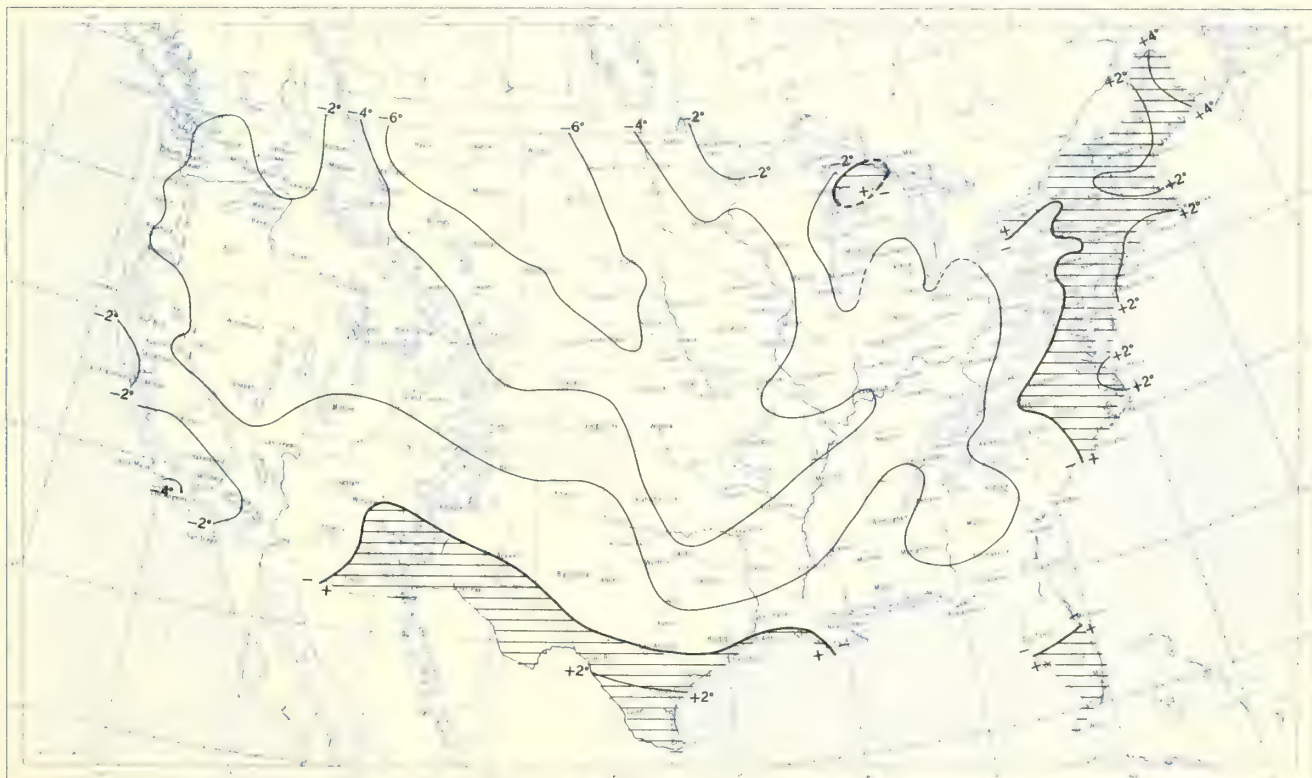




Chart I. A. Average Temperature ( $^{\circ}\text{F.}$ ) at Surface, April 1953.



B. Departure of Average Temperature from Normal ( $^{\circ}\text{F.}$ ), April 1953.



A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

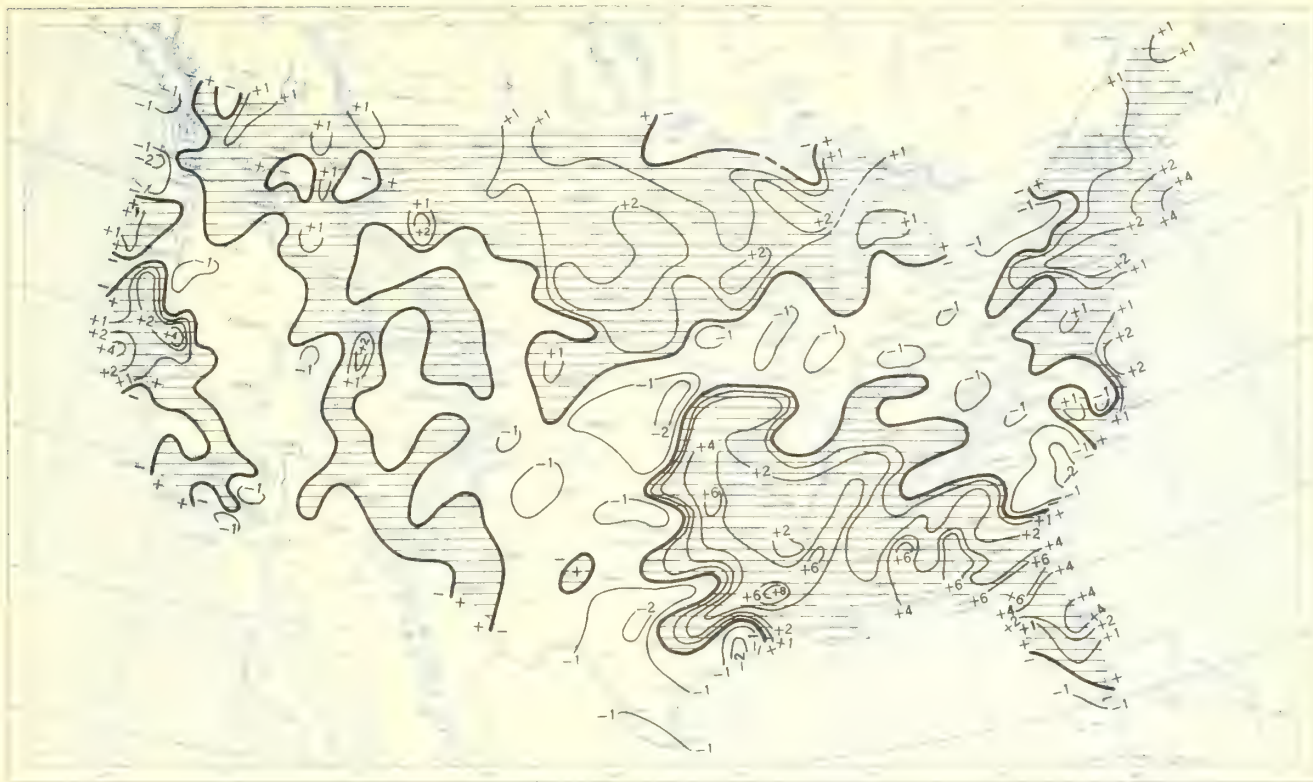


Chart II. Total Precipitation (Inches), April 1953.

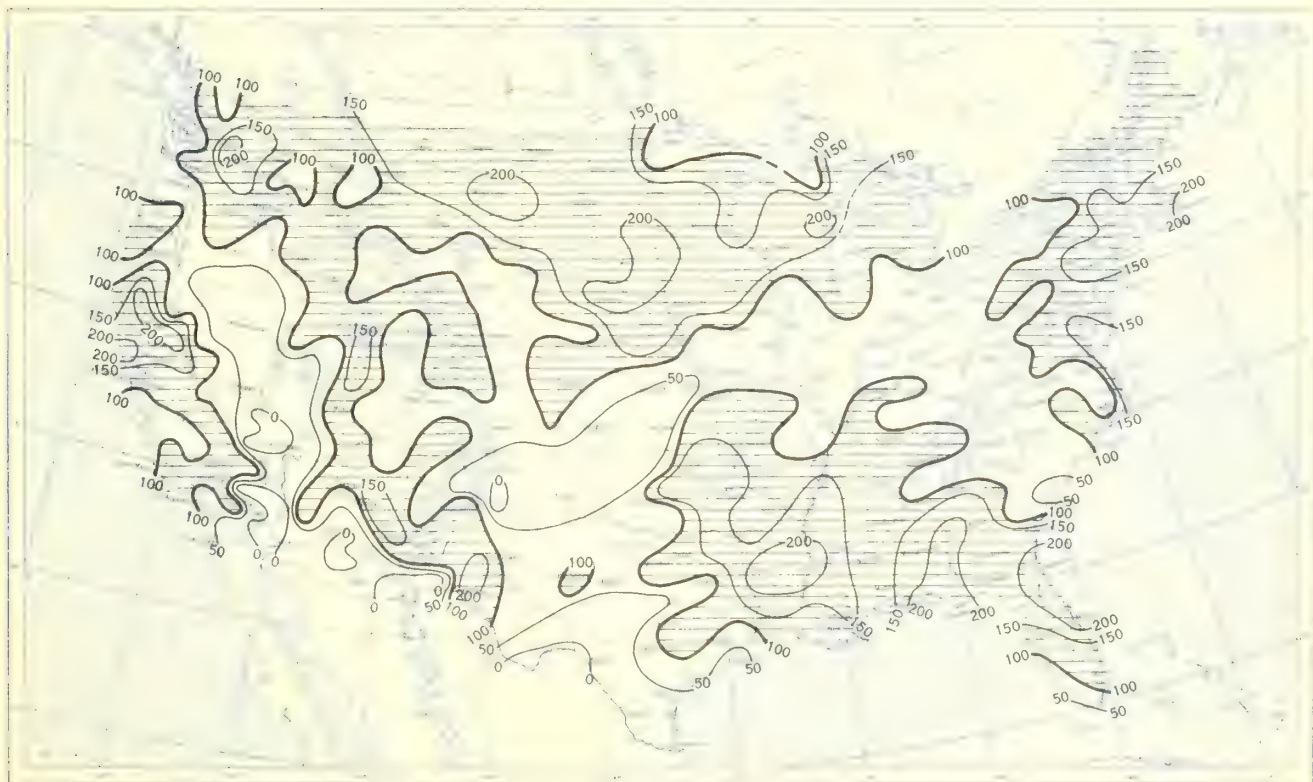


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), April 1953.



B. Percentage of Normal Precipitation, April 1953.



Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

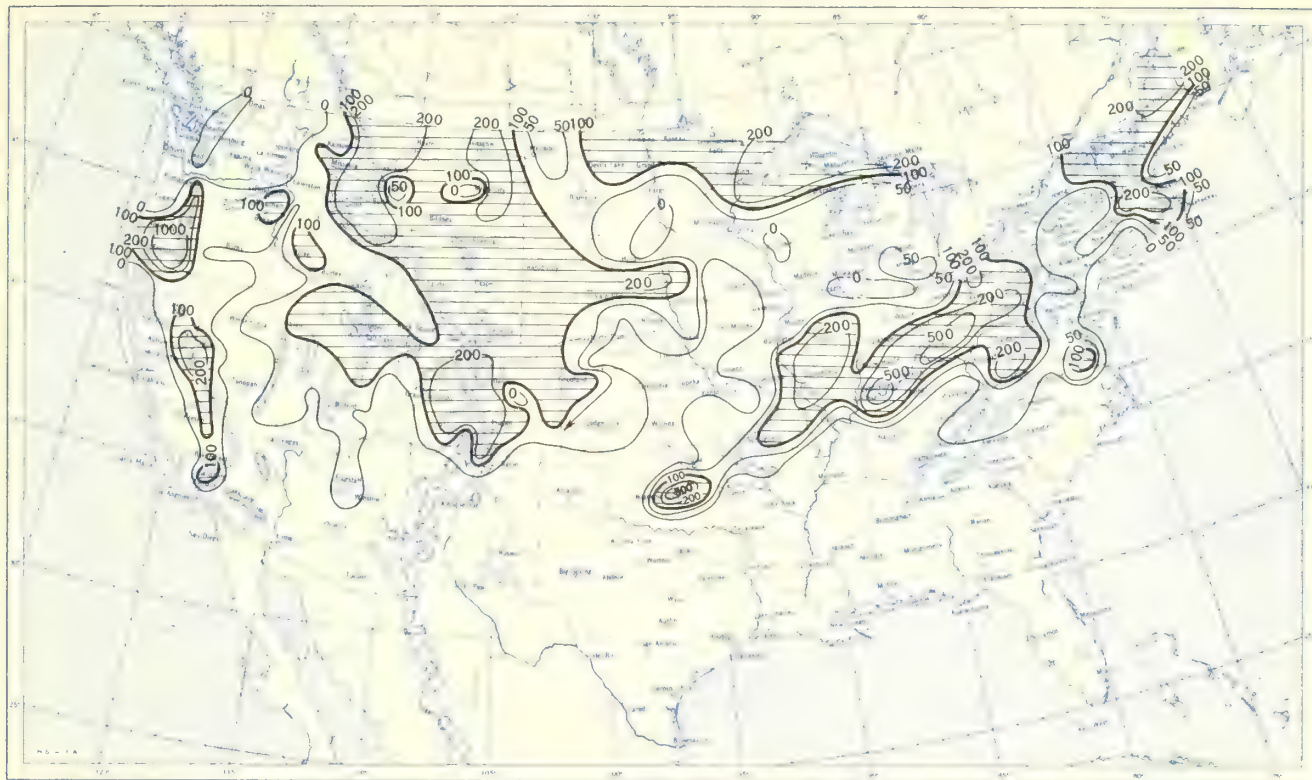


Chart IV. Total Snowfall (Inches), April 1953.



This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, April 1953.



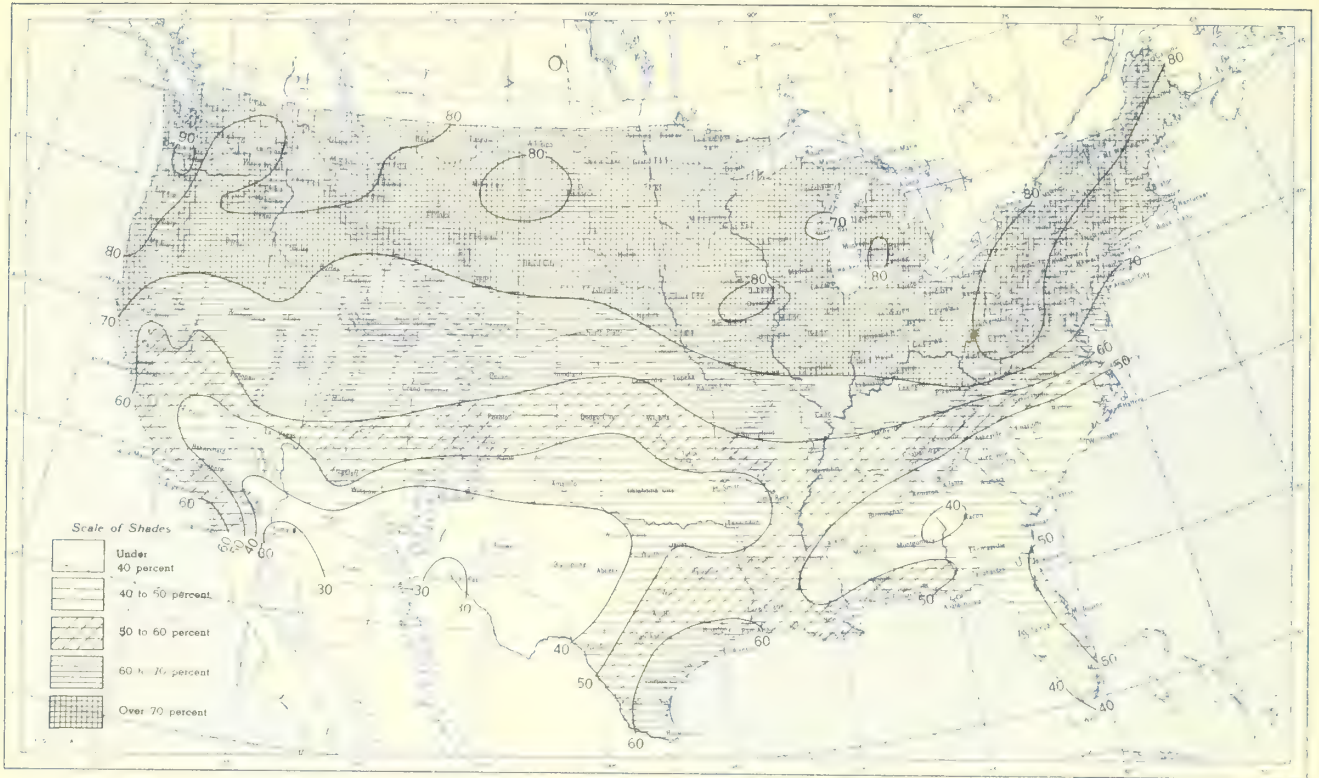
B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T.



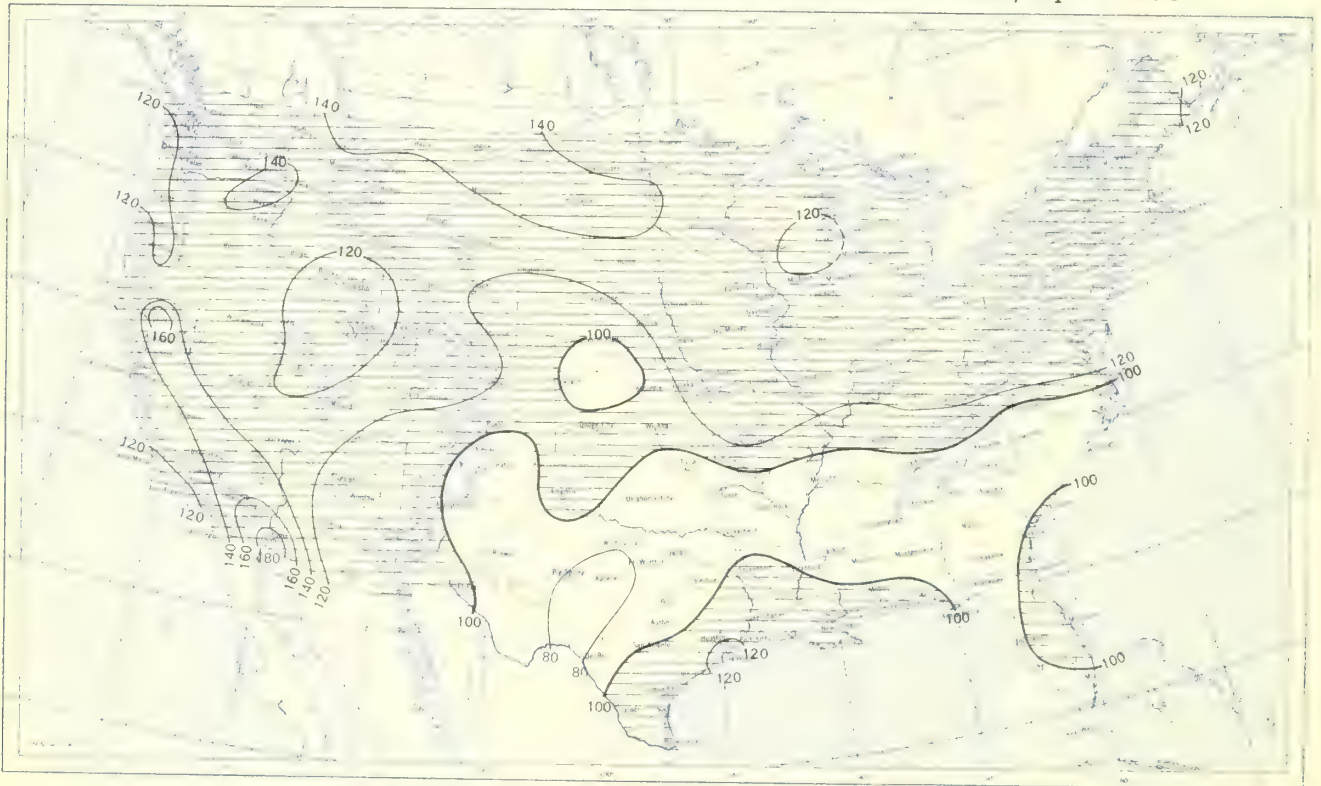
A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.  
 B. Shows depth currently on ground at 7:30 a. m. E. S. T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.



Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, April 1953.

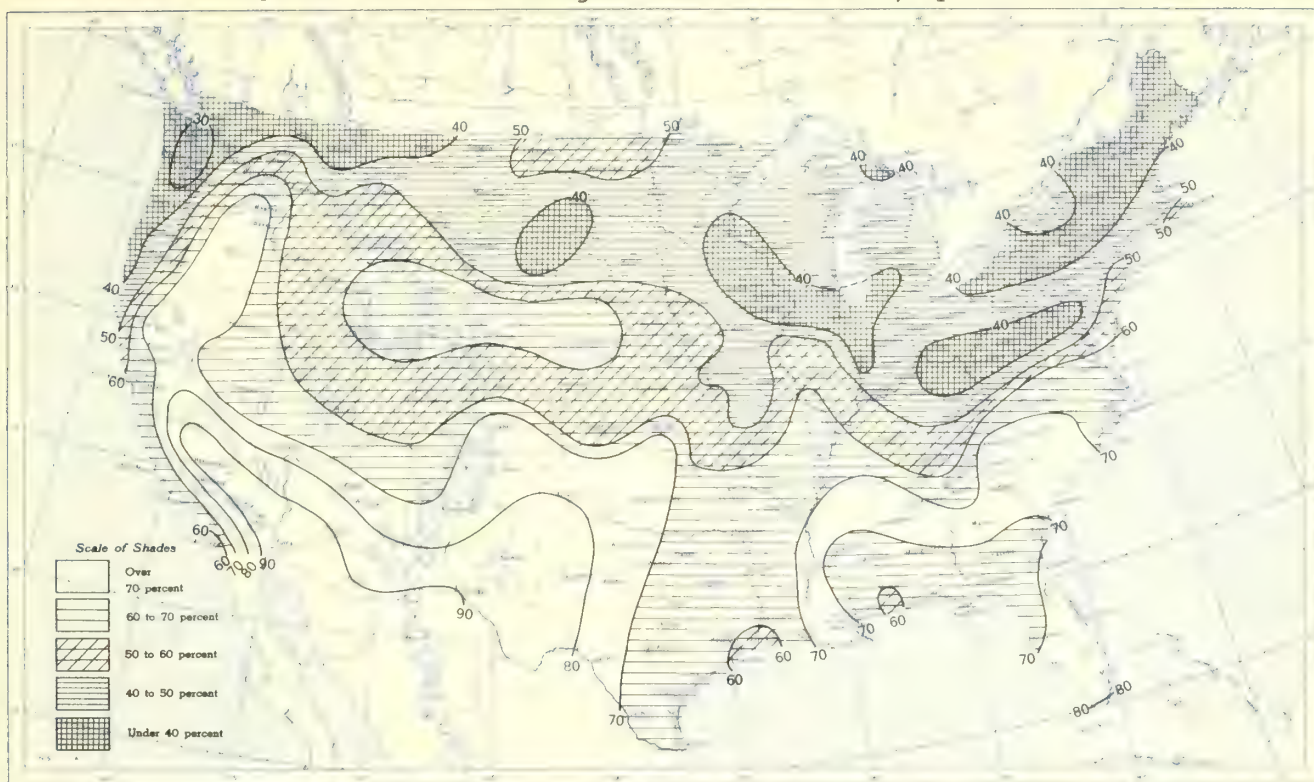


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, April 1953.

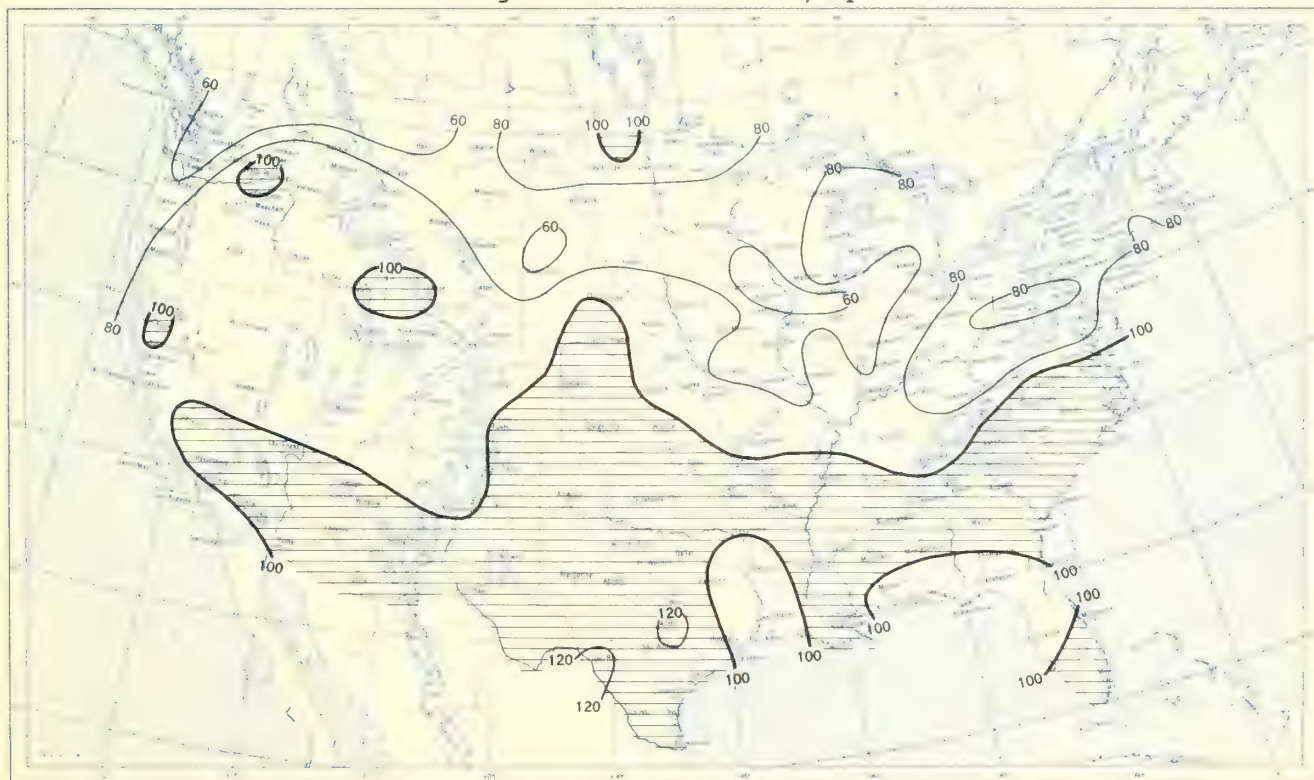


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, April 1953.



B. Percentage of Normal Sunshine, April 1953.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.



Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, April 1953. Inset: Percentage of Normal Average Daily Solar Radiation, April 1953.

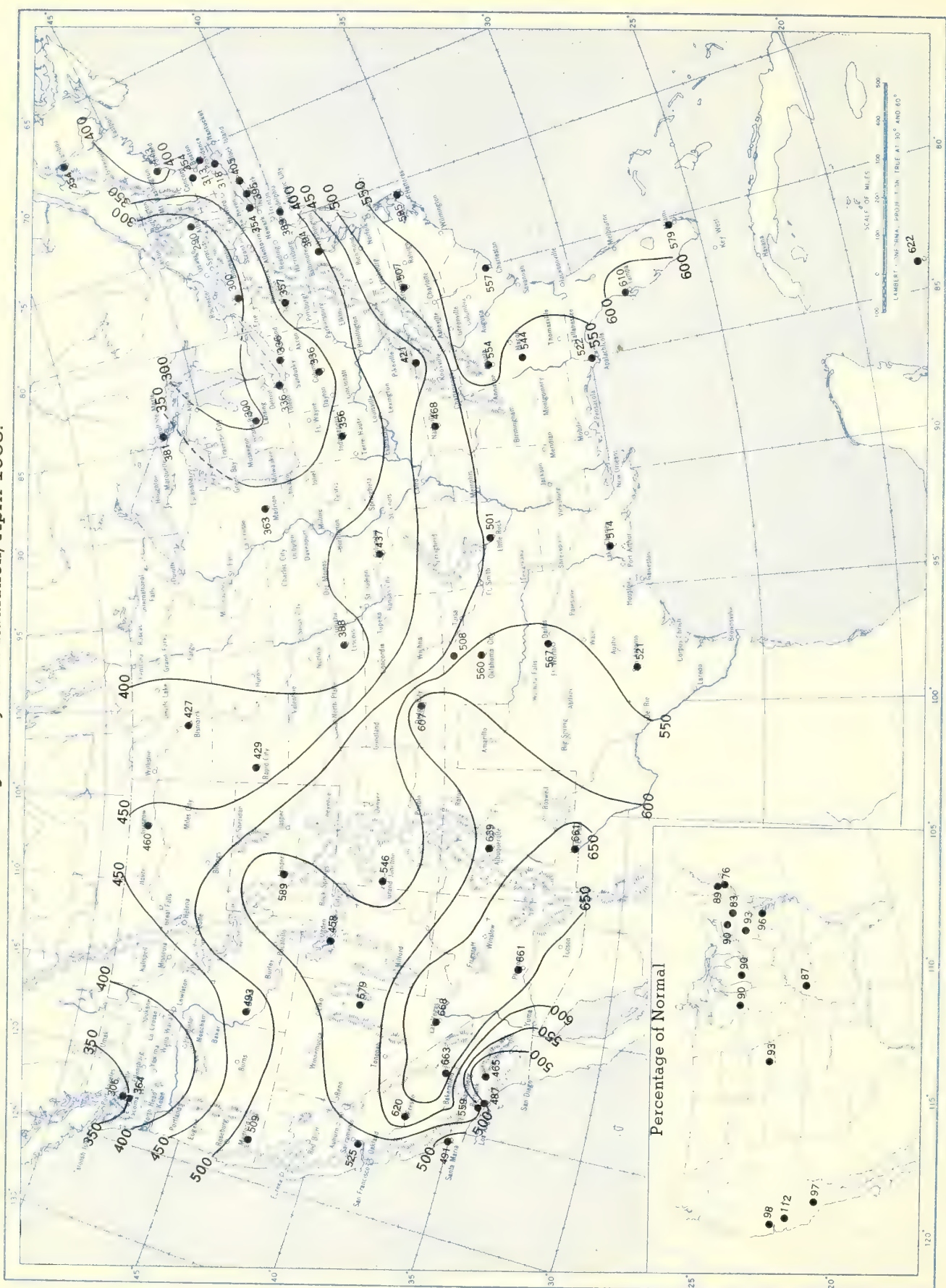
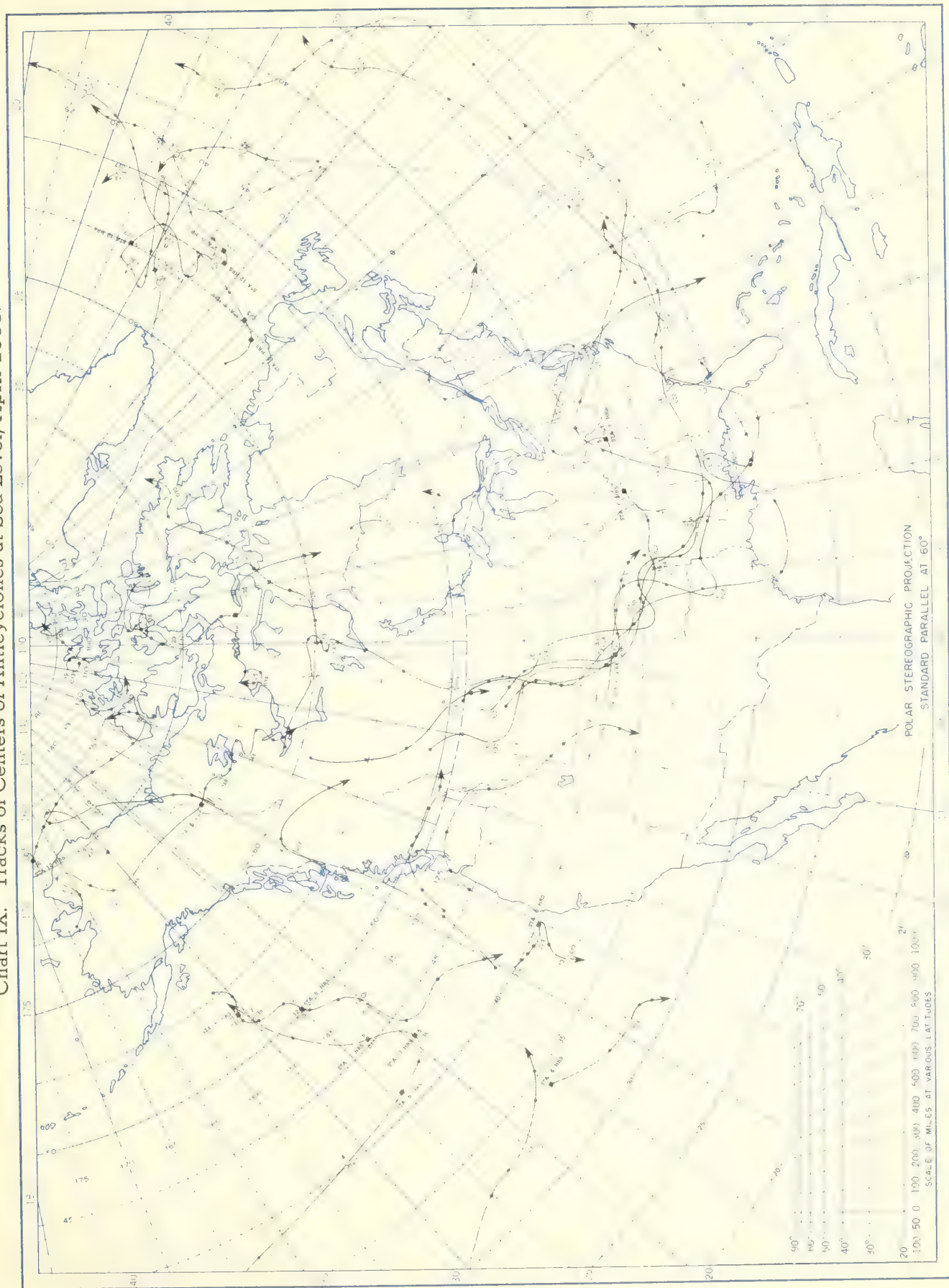


Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langley's (1 langley = 1 gm. cal. cm.<sup>-2</sup>). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, April 1953.



(Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.)



Chart X. Tracks of Centers of Cyclones at Sea Level, April 1953.

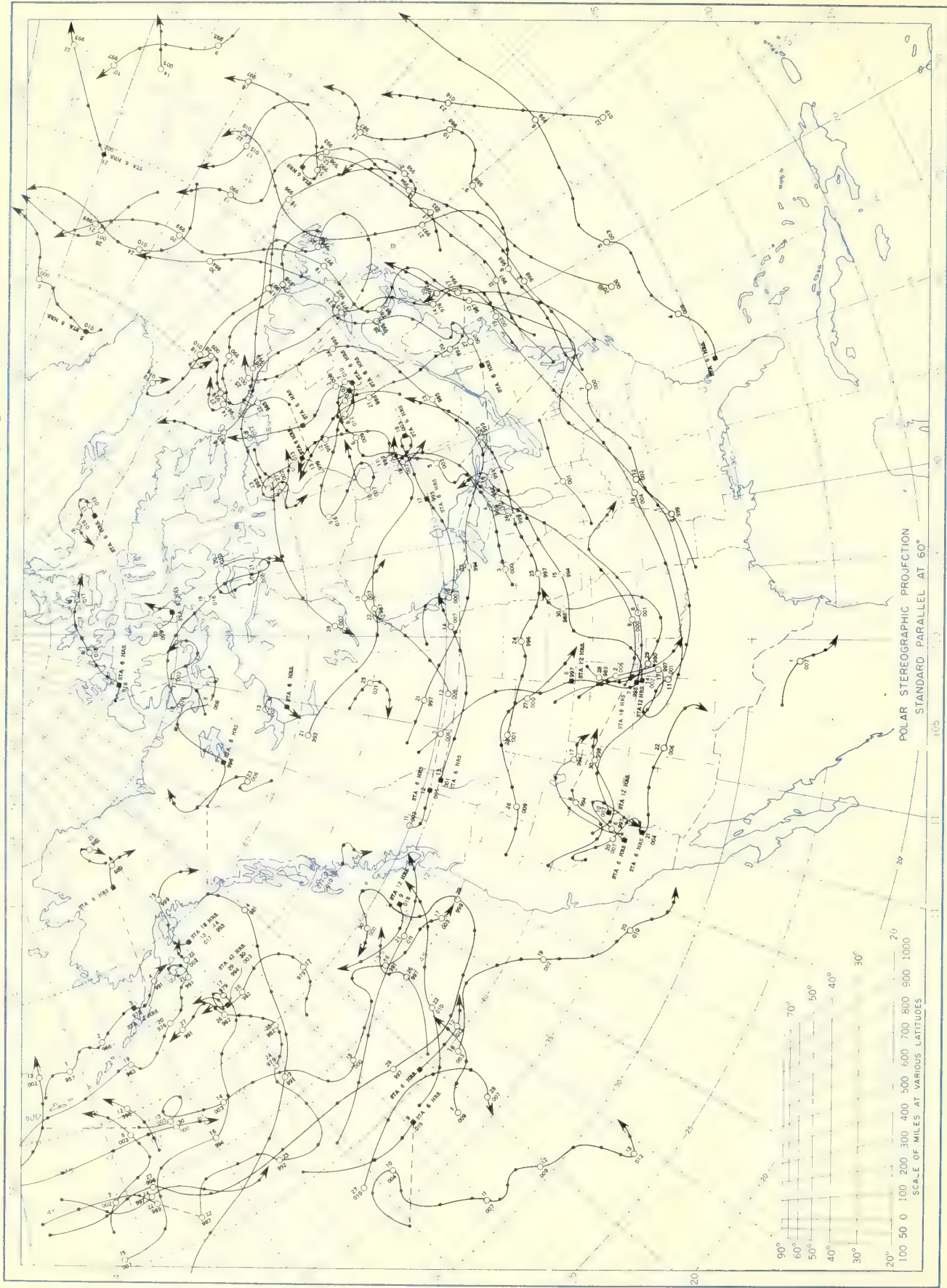
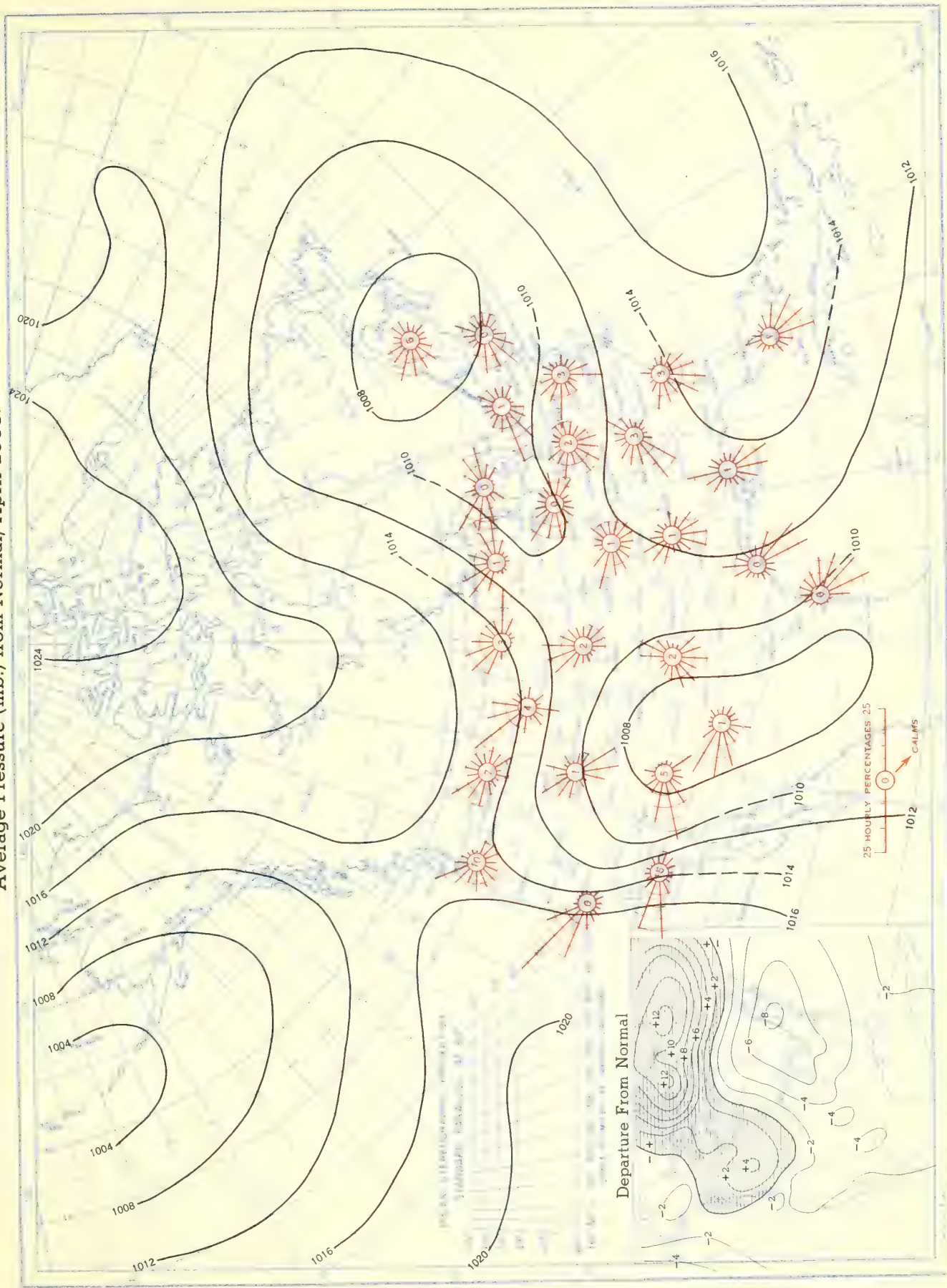


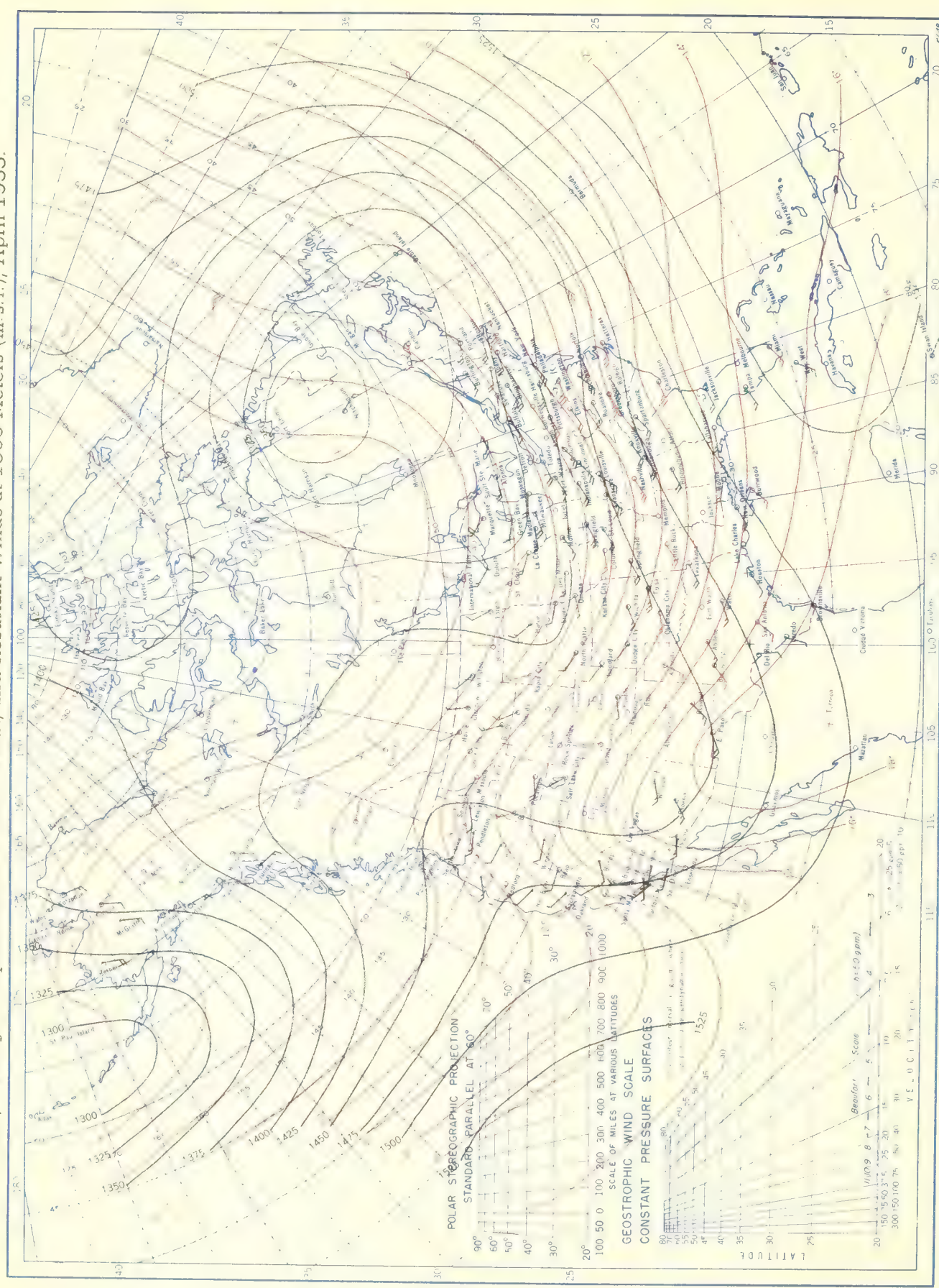
Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, April 1953. Inset: Departure of Average Pressure (mb.) from Normal, April 1953.



Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° inter-sections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.



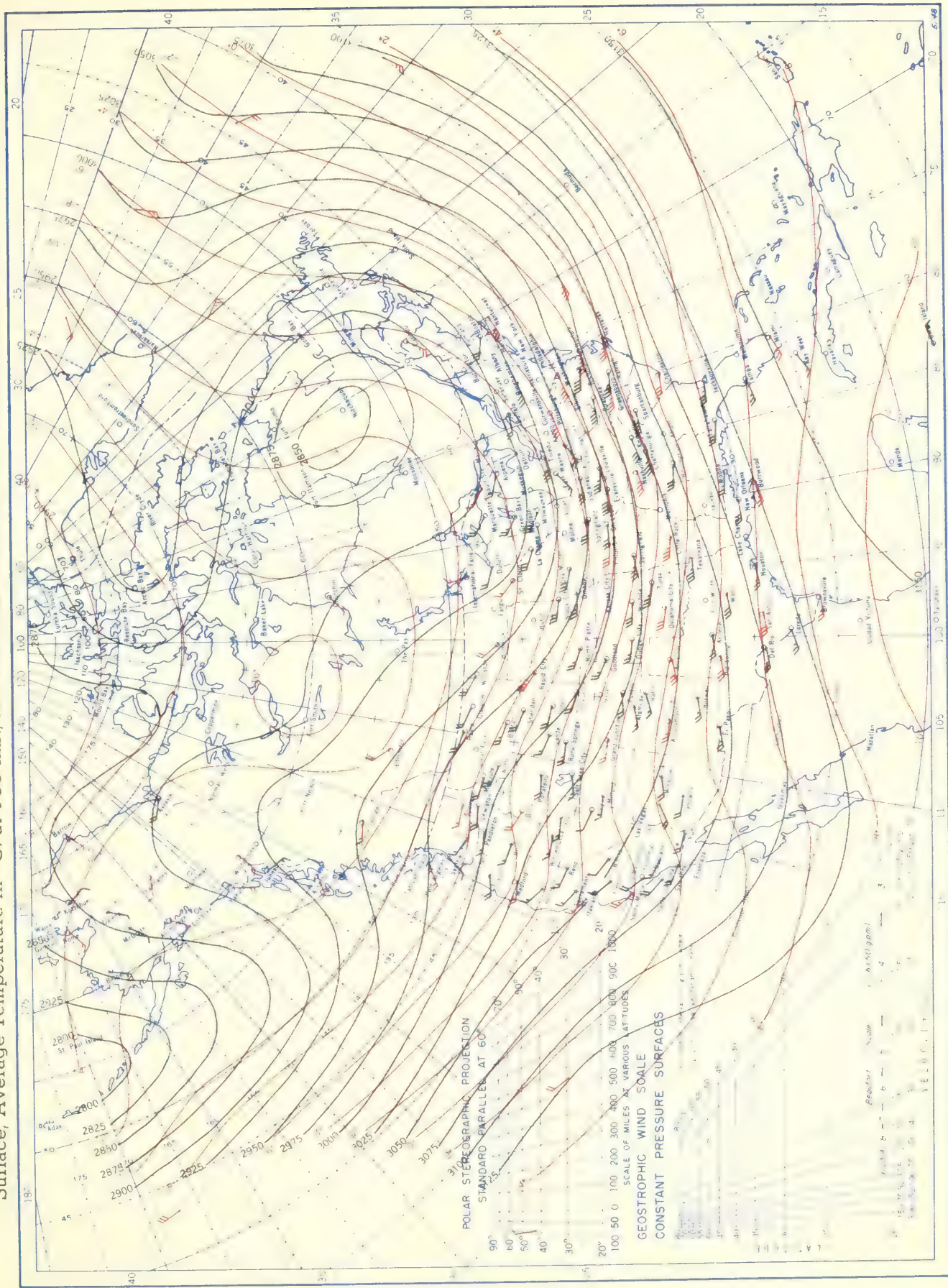
Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), April 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.



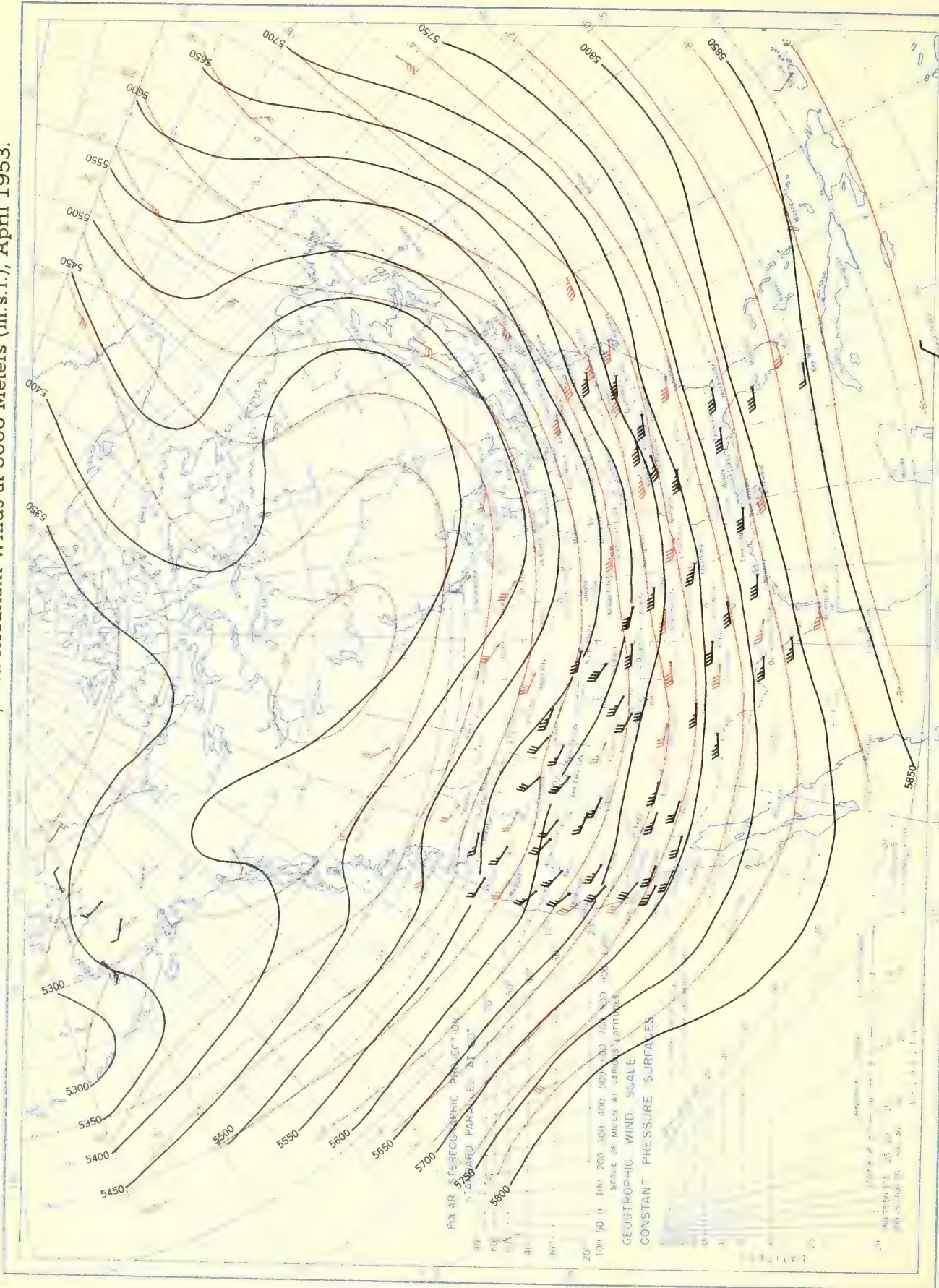
Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 700-mb. Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), April 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.



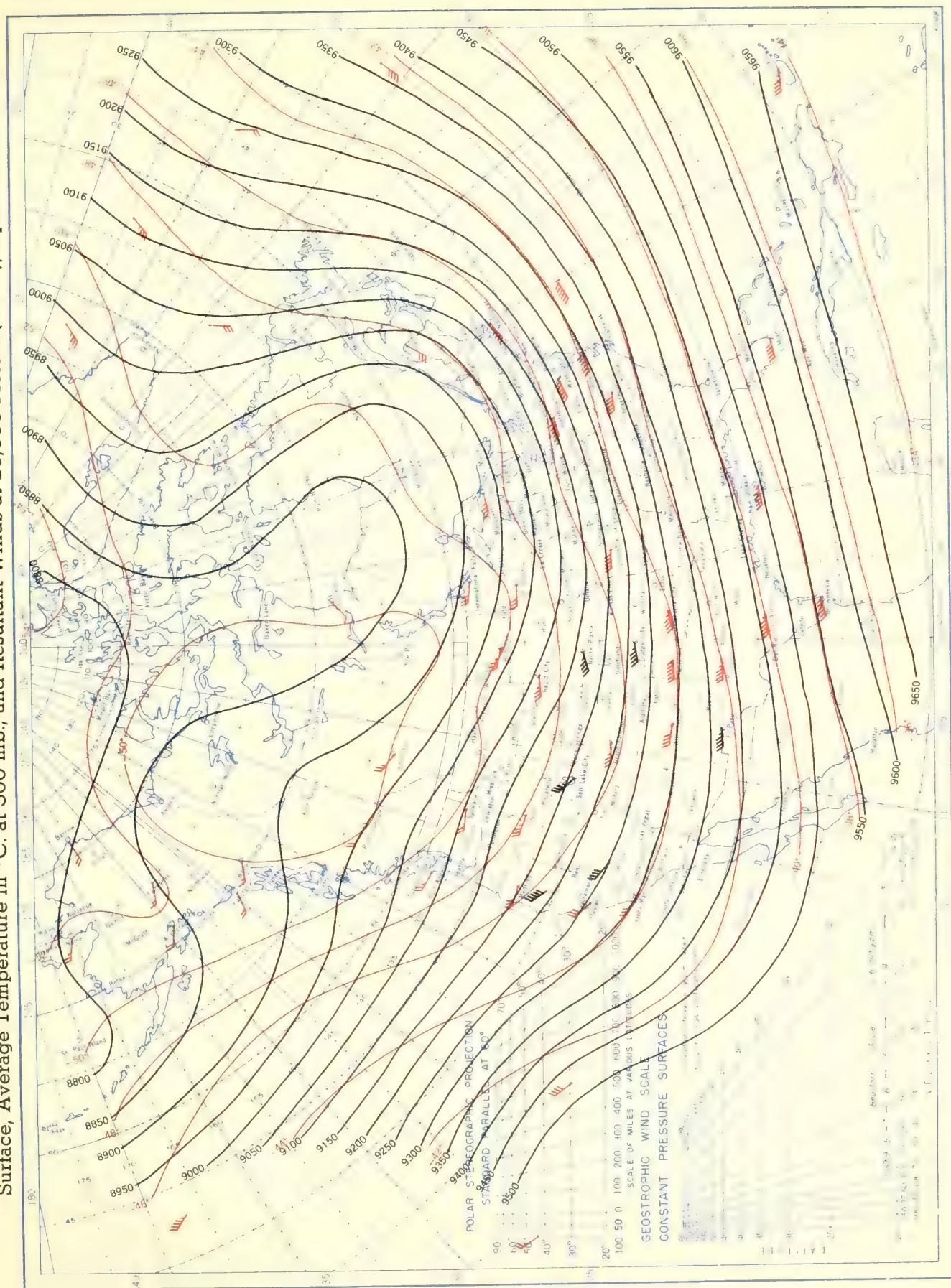
Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), April 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.



Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), April 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.



U. S. Department of Commerce

WEATHER BUREAU

Official Business

Permit No. 1024

Clemson College  
Clemson  
South Carolina

CD

Penalty for private  
use to avoid pay-  
ment of postage  
\$300.

U. S. DEPARTMENT OF COMMERCE

SINCLAIR WEEKS, Secretary

WEATHER BUREAU

F. W. REICHELDERFER, Chief

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY



MAY 1953

Volume 4 No. 5





## C O N T E N T S

SURFACE DATA	Page
General Summary of Weather Conditions-----	119
Condensed Climatological Data - States -----	121
Climatological Data - Stations-----	122
Heating Degree Days-----	127
Severe Storms-----	128
General Summary of River and Flood Conditions-----	150
Flood Stage Data-----	153
UPPER AIR DATA	
Radiosonde Data-----	155
Pilot Balloon Data-----	158
Rawin Data-----	159
SOLAR RADIATION DATA	
Solar Radiation Intensities-----	160
Blue Hill Data-----	161
Daily Totals and Average Daily Totals by Weeks-----	162
Daily Illumination on a Horizontal Surface-----	164
CHARTS I-XV	

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

SUBSCRIPTION PRICE: Monthly and annual, 15 cents per copy; yearly subscription, including monthly and annual issues, \$1.50. Checks and money orders should be made payable to the "Treasurer of the United States." Remittance and correspondence regarding subscriptions should be sent to "Superintendent of Documents, Government Printing Office, Washington 25, D.C."

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

Volume 4 No. 5

MAY 1953

### GENERAL SUMMARY OF WEATHER CONDITIONS

Unusual May weather was experienced in widely separated sections of the Country. West of the Great Plains persistent below-normal temperatures retarded crop growth, and frequent frosts and freezes caused light to locally severe fruit damage in scattered sections of the Rocky Mountain States. Conversely, temperatures in much of the southeastern United States were persistently above normal with monthly averages and extremes for many stations and a few States establishing new May records. Sharply contrasting conditions prevailed in the central interior where a near record late season cold snap occurred as far south as the Texas Panhandle on the 13th and 14th when freezing damaged some wheat in western Kansas and some fruit and other crops in parts of Nebraska, Iowa, and Minnesota.

Precipitation variations were similarly pronounced. Unusually frequent and locally heavy rains over much of the northern half of the nation and in a belt extending from the lower Ohio Valley into eastern Texas delayed farm work which was 2 to 3 weeks behind schedule in many sections at the end of the month, and caused serious flooding from Georgia to eastern Texas and some flooding in Montana. These rains, however, restored subsoil moisture in several north-central localities and checked forest fires in northern Minnesota. In contrast, precipitation was less than 50 percent of normal in much of the lower Great Plains and Southwest where small grains and pastures were in poor condition. Also, frequent strong winds in the Southwest speeded the dessication of the soil and caused considerable erosion. Along the east Gulf Coast, and in parts of Florida and the Carolinas rainfall was less than 50 percent of normal and crops were urgently in need of rain at the end of the month.

Thunderstorms, accompanied often by damaging winds and hail, occurred with great frequency from the lower Mississippi Valley to New England. Thunderstorms occurred on 15 days at Harrisburg, Pa.; 13 days (a new record) at Atlantic City, N. J.; 11 days at Baltimore, Md.; and 9 days (a new record) at Pittsfield, Mass.

Sunshine, while slightly below normal over the major portion of the Country, was much below in the Middle Atlantic States, and above normal in southern California, the central and lower Great Plains, and the south Atlantic Coastal States. In the latter area Charleston, S. C., recorded the greatest amount of sunshine in 42 years.

**TEMPERATURE.**—Temperatures averaged well below normal in the far West with greatest departures centered in Nevada. Monthly averages were the lowest on record for May at scattered stations such as Fresno, Calif., and Las Vegas and Winnemucca, Nev. At the latter station daily averages were above normal on only two days, and a minimum of 12° on the 10th was a new May low for that station.

Average temperatures for the month were slightly above normal in the south-central interior and Great Lakes Region, but well above in the remain-

ing eastern sections. The greatest departures for individual stations, up to 6°, occurred in the Carolinas. State-wide averages for Florida and South Carolina established new May highs, and the average for North Carolina equaled the former record.

East of the Rocky Mountains abnormally warm weather generally prevailed after the 19th, except for a cold spell in the Great Lakes Region and Northeast on the 27th to the 30th. This was particularly true in central and southern areas where many stations recorded new May maxima. Among these were Wilmington, N. C., 98° on the 26th; Raleigh, N. C., 99° on the 31st; New Orleans, La., 97° on the 28th; St. Louis, Mo., 98° on the 26th (the highest May temperature since 1836); Cairo, Ill., 98° on the 26th; Apalachicola, Fla., 96° on the 26th; and Tallahassee, Fla., 102° on the 27th. Oklahoma's highest reading, 110° at Hollis on the 23d, was a new State record for May. The highest for the month, 112°, was recorded at Presidio, Tex., on the 23d, and the lowest, -1°, at Crested Butte, Colo., on the 2d.

**PRECIPITATION.**—Floods in the South were caused by excessive rains which began late in April and continued intermittently through May 18th in Louisiana, eastern Texas, southern Arkansas, and western Mississippi, and through May 7th in Alabama and Georgia. The heaviest rainfall was centered in Louisiana where monthly totals ranged up to 30.52 inches at Cheneyville. In other southern locations monthly totals ranged up to 20.44 inches at Bon Wier, Tex.; 16.75 at Warren, Ark.; 22.88 at Woodville, Miss.; 10.88 at Union Springs, Ala.; and 15.04 inches at Milledgeville, Ga. These floods resulted in 12 deaths and property damage of nearly \$100,000,000 in Louisiana, and losses that probably exceeded \$1,000,000 in each of the States of Texas, Mississippi, and Alabama.

Rainfall was particularly frequent in the Northeast where many stations reported measurable amounts on more than 20 days. At a few scattered stations May totals were the greatest on record, the most noteworthy being 8.96 inches at Albany, N. Y., the greatest May total there since 1826. On the 26th a million dollar flash flood damage occurred in Lackawanna, N. Y., as the result of heavy rains on the 25th and 26th and the collapse of a small dam near Orchard Park.

Precipitation was less than 25 percent of normal in much of the Great Plains area from western Nebraska southward and less than 10 percent in the Rio Grande Valley of Texas. As a result of scanty rainfall during the month and hot drying winds after the 19th, droughty conditions appeared serious in the western third of Oklahoma and western and southern Texas at the end of the month. At Brownsville, Tex., May was the 11th consecutive dry month, and the Rio Grande River at that point continued low with no flow most of the month; crops suffered from the short supply of irrigation water.

In Florida and the Carolinas heat and the absence of rain after the 19th created an extremely



MAY 1953

dry condition by the end of the month. This condition was most severe in Florida where the vegetable season was shortened, watermelon prospects were dimmed in central and northern portions, corn and tobacco suffered heavily and pastures were rather poor. Because of earlier rains the May dry conditions were not as serious in the Carolinas.

**SNOWFALL.**—In the northern mountainous areas of the West May snowfall was rather frequent and monthly totals were generally above normal. One of the heaviest snowstorms reported occurred in Montana on the 24-26th when 61.3 inches fell at Rogers Pass and 29 inches at Phillipsburg. Rogers Pass and Kings Hill, Mont., recorded monthly totals of 79 and 66 inches, respectively. A record monthly total of 4.7 for May occurred at Mt. Shasta, Calif., and 6 inches fell in 24 hours at Lander, Wyo., on the 9th.

East of the Rockies the only appreciable snowfall occurred in the Great Plains and in northeastern Mountains. In North Dakota measurable snow fell on the 1st and again on the 11th and 12th with heaviest amounts in western portions where monthly totals ranged up to 8.4 inches at Richardton. Heavier amounts occurred in the Black Hills on the same dates. Snowfall measuring up to 3 inches occurred as far south as western Oklahoma on the 12th and 13th. Monthly totals ranged up to 2 inches in northern Minnesota and 4 inches in northern New England.

**DESTRUCTIVE STORMS.**—For the second consecutive month the tornado was the outstanding destructive storm. During May 113 tornadoes were reported by reliable sources, and this number is the greatest ever recorded in one month. (Note: The present tornado reporting network is more dense

than ever before; as a consequence fewer tornadoes go unreported). One tornado caused the greatest damage (expressed in dollars) of any in history. It struck Waco, Tex., on the 11th killing 114 people and causing \$39,500,000 property damage in the city and additional crop losses of \$1,650,000 in nearby localities. Total property losses caused by this storm were greater than the total tornado losses for any entire year prior to 1953 except 1927.

On the same date as the Waco tornado another twister killed 11 persons and damaged property to the extent of \$3,239,000 at San Angelo, Tex. Another that destroyed much of Hebron, Nebr., on the 9th was responsible for 5 deaths and property losses of \$2,500,000. A series of these storms visited Ohio and Michigan on the 21st, one leaving a path of destruction in St. Clair County, Michigan (where 2 persons were killed and \$2,500,000 worth of property destroyed) and continuing on into Canada where further property losses of \$15,000,000 were reported. On the 10th two tornadoes about 50 or 60 miles apart left parallel paths of devastation in western Wisconsin; 4 persons were killed and total damage was estimated at \$2,000,000.

Compared to the great tornado losses during the month other storm losses seemed small. Nevertheless total deaths and property losses resulting from the great frequency of severe thunderstorms, mostly east of the Rocky Mountains, was considerable. The wind, rain, and hail damage arising from two of these thunderstorms caused losses of \$1,000,000 each. Both occurred on the 22d, one in Iroquois County, Ill., and the other in northwestern Indiana.

# CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

MAY 1953

Section	Temperature								Precipitation							
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes				Station	Least
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least		
	*F	*F		*F			*F		In	In		In				In
Alabama	74.3	+2.8	Geneva	102	*26	Valley Head	41	1	4.22	+0.32	Union Springs	10.88	Newton			0.54
Arizona	60.3	-5.5	2 Stations	103	23	Alpine	10	10	1.10	-.22	Phoenix WB AP	.71	54 Stations			.00
Arkansas	70.1	+1.0	3 Stations	99	*28	Mammoth Spring	38	*6	7.59	+2.48	Warren	16.75	Henderson 2W			2.20
California	57.5	-5.6	2 Stations	101	*18	Twin Lakes	5	1	1.37	-.53	Gasquet RS	10.30	38 Stations			.00
Colorado	49.0	-2.7	Eversoll Ranch	103	26	Crested Butte	-1	2	1.77	+0.02	Trinidad CAA AP	4.20	Mesa Verde NP			.22
Connecticut	59.2	+1.7	Waterbury	93	11	Mansfield Hollow Dam	28	4	4.38	+5.53	Salisbury	6.32	Saugatuck Res.			2.96
Delaware	66.5	+3.3	2 Stations	90	*11	Georgetown	40	29	5.39	+1.69	Dover	7.33	Millsboro			4.03
Florida	79.5	+3.8	3 Stations	104	*21	5 Stations	58	*10	1.60	-.23	Pensacola CAA AP	6.02	2 Stations			.00
Georgia	75.6	+3.4	Bainbridge	108	27	Blairsville Exp. Sta.	40	*9	4.18	+7.4	Milledgeville	15.04	Savannah Bch. 2N			.40
Idaho	48.6	-4.6	Orofino	93	6	2 Stations	10	2	2.49	+9.0	Island Park Dam	5.07	Bonniers Ferry			.81
Illinois	64.0	+1.3	E. St. Louis Parks C	101	26	Stockton	30	13	3.02	-1.11	Wayne City	5.62	Springfield WB AP			1.33
Indiana	64.2	+2.2	Evansville	98	26	Notre Dame Moreau	31	3	4.03	-.07	Greensburg 3SW	6.48	Terre Haute WB AP			2.06
Iowa	60.0	-.4	Sidney	98	25	Inwood 2W	26	13	2.32	-1.64	Clarence	4.63	Emerson SNE			.74
Kansas	63.4	-.4	4 Stations	106	*26	3 Stations	21	14	2.62	-1.15	Manhattan	7.37	Preston SNW			.47
Kentucky	68.7	+3.3	Princeton	98	26	Inez	39	6	5.42	+1.42	Baxter	8.74	Grant Dam 38			2.33
Louisiana	75.7	+2.3	3 Stations	99	*27	2 Stations	41	6	13.13	+8.39	Cheneyville	30.52	New Orleans Algiers			.86
Maine	54.0	+1.5	7 Stations	90	10	Millinocket Dam	23	1	3.04	-.21	Hiram 2S	4.50	Stratton			2.09
Maryland	67.3	+4.4	Waldorf Police Brks.	95	23	2 Stations	33	29	6.10	+2.36	Silver Hill Obs.	9.99	Ocean City			1.20
Massachusetts	58.0	+1.5	Turners Falls	93	11	5 Stations	29	4	4.66	+1.21	Hoosac Tunnel	9.02	Nantucket WB AP			1.86
Michigan	55.3	+1.4	Onaway 12S	95	9	2 Stations	17	*13	3.09	-.23	Mott Island	7.33	Suttons Bay			1.22
Minnesota	54.6	-.3	Albert Lea	94	29	do	18	13	4.17	+1.02	Pelican Rapids	8.21	St. Paul WB AP			1.64
Mississippi	74.1	+2.2	2 Stations	101	*27	Ripley	44	8	7.88	+3.55	Woodville	22.88	Biloxi Display			.67
Missouri	65.5	+1.9	Saint Charles	100	26	Fountain Grove W. L.	32	4	2.97	-1.83	Keytesville	6.43	Van Buren			1.09
Montana	48.5	-4.4	Miles City	93	7	Harlowton	4	12	3.81	+1.82	Rogers Pass	13.84	Rexford RS			.52
Nebraska	57.8	-1.5	Oxford	102	24	Nenzel 19S	14	13	2.55	-.88	Greeley	6.89	Ogallala			.35
Nevada	50.6	-6.4	Overton	98	23	Fish Creek Ranch	10	10	.99	+2.1	Owyhee	4.48	3 Stations			.00
New Hampshire	56.1	+2.1	Keene	92	10	Fabyan	26	4	4.37	+1.07	Alexandria	7.29	L. xville Notch			2.01
New Jersey	62.9	+2.3	2 Stations	93	*11	Long Valley	34	29	5.72	+1.84	Belleplain	10.4	Sussex			3.08
New Mexico	57.5	-3.5	Jal	107	23	Wolf Canyon	8	3	.72	-.47	Lake Maloya	3.64	17 Stations			.00
New York	57.5	+1.5	N.Y. WB La Guardia	96	11	Wanakena Ranger Sch.	21	3	5.25	+1.68	Inghams	9.43	Peru 3SW			2.39
North Carolina	72.4	+5.0	Lumberton CAA AP	102	31	Celo 2S	34	*10	3.16	-.78	Red Springs	8.66	Greensboro WB AP			.91
North Dakota	51.8	-2.1	Pembina 2N	92	*7	2 Stations	19	13	4.06	+1.80	Max	6.61	Bowman 30NNW			1.98
Ohio	64.0	+3.4	6 Stations	95	*10	do	33	28	4.22	+4.47	Norwalk	8.00	Thornville			1.79
Oklahoma	69.1	+9	Hollis	110	23	Hooker	25	14	2.72	-2.10	Idabel	8.46	Roosevelt			.58
Oregon	50.1	-3.9	The Dalles	93	6	Fremont	8	10	3.52	+1.77	Powers	10.42	Merrill 2NW			1.04
Pennsylvania	62.2	+2.6	3 Stations	93	*11	3 Stations	27	29	6.88	+2.80	Torpedo 4W	12.71	Greensboro Lock 7			3.38
Rhode Island	57.5	+1.6	Greenville	88	11	Kingston	33	4	3.65	+2.22	Greenville	4.62	Block Island WB AP			2.45
South Carolina	75.6	+4.5	Tilghman Forest Nmy.	103	*25	Caesars Head	44	8	3.56	+0.08	Sassafras Mtn.	7.90	Sullivan's Island			.75
South Dakota	54.2	-2.2	2 Stations	95	*29	2 Stations	9	12	2.76	-.09	Thunder Hawk	7.79	Rumford			.47
Tennessee	70.2	+3.2	3 Stations	98	*26	Decatur 1N	36	11	6.16	+2.05	Moscow	11.99	Morgan Springs			2.79
Texas	73.0	+5	Presidio	112	23	Spearman	26	14	3.13	-.28	Bon Weir	20.44	6 Stations			.00
Utah	50.8	-4.9	Moab	93	31	Silver Lake Brighton	7	3	1.00	-.09	Silver Lake Brighton	5.53	3 Stations			.00
Vermont	56.5	+2.5	Bellows Falls	92	12	Somerset	25	4	4.73	+1.38	Wardsboro	8.60	Alcomfield			2.23
Virginia	69.2	+5.0	2 Stations	98	*27	Berryville	35	29	4.20	+3.39	Episcopal High Sch.	12.43	Clarksville			1.07
Washington	53.3	-2.0	do	92	5	Harrington 1N	20	2	2.37	+4.47	Palmer 3SE	8.75	Kennewick			.35
West Virginia	66.1	+4.3	New Cumberland Dam 9	97	31	3 Stations	29	*28	4.32	+2.28	Alpena 1NW	7.37	Cranberry Glades			2.32
Wisconsin	55.7	+5	Arlington	95	30	Danbury	14	13	2.99	-.52	Bayfield	9.24	Sturgeon Bay Exp. Fm.			.93
Wyoming	46.3	-3.7	Basin	88	27	Sage	7	2	1.79	-.19	Middle Fork	4.42	Bill 14SE			.07

\* Other dates also.



## CLIMATOLOGICAL DATA

MAY 195

Table 2

State and station	Pressure			Temperature										Precipitation										Wind			No. of days		Sky cover, tenths (sunrise to sunset)	Possible sunshine																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	Elevation (ground)	Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Temperature				No. of days	No. of days	Snow, Sleet, Hail	Average hourly speed	Prevailing direction	Fastest mile		to sunset																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
								Highest	Date	Lowest	Date						No. of days		to sunset																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
								Ft.	Mb.	Mb.	°F						°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F			°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F



## CLIMATOLOGICAL DATA

Table 2—Continued

MAY 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation										Wind			No. of days (sunrise to sunset)						
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Lowest	Date	No. of days 90° F. or above	No. of days 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days .01 inch or more	Snow, Sleet, Hail	Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine				
Fl.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	%	In.	In.	In.	.01 inch or more	In.	In.	M. p. h.	M. p. h.	M. p. h.	O-3	4-7	8-10	%							
INDIANA (Cont.)																																	
South Bend	768	985.4	1013.5	72	49	60.5	+2.1	92	30	38	3	1	0	50	71	2.75	-1.09	0.91	10	6	0	0	10.7	S	*33	WSW	21	5	11	15	6.7	4	56
Terre Haute	585	991.2	1013.4	75	55	64.9	+2.2	90	26	43	13	3	0	56	72	2.06	-2.37	.96	9	6	0	0	8.5	S	---	---	9	7	15	6.4	---		
IOWA																																	
Burlington	694	987.5	1012.9	71	50	60.5	-1.4	92	30	37	3	2	0	50	70	2.19	-1.63	1.10	10	4	T	T	10.9	NE	34	SW	10	8	7	16	6.5	68	
Charles City CO	1013	975.6	-----	70	49	59.1	+5.1	91	29	30	13	2	1	---	---	2.84	-1.02	.72	12	4	T	T	7.0	---	---	31	SW	20	9	9	13	5.7	53
Des Moines	948	981.4	1012.5	71	50	60.4	-8.9	92	25	33	13	3	0	48	66	2.22	-1.38	1.38	7	6	T	T	12.5	S	63	NW	22	6	9	16	6.5	55	
Dubuque	1065	973.6	1012.7	68	47	57.5	-4.4	90	30	32	13	1	4	47	65	2.94	-5.53	1.16	10	6	T	T	---	---	*33	WNW	21	6	5	20	6.9	---	
Sioux City	1093	970.2	1011.3	71	48	59.8	-6.6	91	29	33	13	1	0	48	68	2.31	-1.03	1.59	13	10	T	T	10.7	SSE	49	SW	10	8	8	15	6.2	68	
KANSAS																																	
Concordia CO	1375	961.7	-----	73	52	62.4	- .8	97	25	31	14	3	1	64	3.51	-1.10	2.44	10	6	T	T	9.4	---	34	E	27	9	9	13	5.6	59		
Dodge City	2594	923.5	1010.1	76	51	63.2	+2.1	101	26	32	13	9	2	43	56	.68	-2.23	.24	9	1	T	T	17.1	S	56	NW	10	9	14	8	5.4	73	
Goodland	3645	884.9	1010.6	71	42	56.2	-1.9	95	24	25	13	2	3	39	59	2.39	-.30	.99	13	4	T	T	14.7	NW	*40	SSE	28	11	6	14	5.7	---	
Topeka	879	976.3	1011.7	74	53	63.7	-1.1	95	25	36	14	5	0	53	70	4.53	+2.1	1.73	14	8	T	T	11.6	SSE	47	S	10	4	15	12	6.5	60	
Wichita	1372	962.8	1010.6	75	56	65.6	+7.7	99	31	37	13	7	0	52	65	2.02	-1.77	.76	9	4	T	T	15.6	S	45	SW	10	7	9	15	6.3	67	
KENTUCKY																																	
Lexington	979	979.0	1014.2	78	58	67.9	+5.3	92	30	46	9	4	0	58	74	5.47	+1.91	1.90	12	6	.0	0	10.5	SSW	---	---	---	9	7	15	6.1	---	
Louisville CO	457	-----	-----	78	61	69.5	+3.6	93	26	52	*3	5	0	---	---	4.17	-1.35	1.55	11	---	.0	0	---	---	---	---	---	---	---	---	---	---	
Louisville	485	997.0	1013.3	79	59	69.0	+3.7	94	26	48	*3	6	0	58	71	4.32	+3.9	1.12	11	5	.0	0	8.1	SW	41	S	22	12	4	15	6.1	58	
LOUISIANA																																	
Baton Rouge	64	1010.5	1013.6	86	68	76.8	+3.2	98	28	56	7	9	0	68	78	10.30	+5.78	4.85	11	10	.0	0	8.6	SE	---	---	---	8	12	11	5.7	---	
Lake Charles	12	1011.5	1012.9	85	69	77.4	+2.9	97	28	58	5	6	0	70	82	11.13	+6.40	5.07	9	8	T	T	10.1	S	32	ESE	13	7	10	14	6.4	---	
New Orleans CO	9	1012.2	-----	87	72	79.1	+3.0	97	28	63	7	10	0	---	---	1.28	-4.15	.92	6	6	.0	0	6.8	---	---	23	SW	15	8	13	10	5.8	73
New Orleans	3	1011.9	1014.0	87	69	77.9	+3.3	96	28	55	7	11	0	62	77	1.39	-4.15	.58	8	6	T	T	9.9	S	32	SSE	4	15	8	8	4.9	---	
Shreveport	252	1003.1	1012.5	84	65	74.7	+9.9	95	28	48	5	11	0	65	76	8.35	+3.80	2.82	11	10	.0	0	9.6	S	---	---	---	10	7	14	5.8	61	
MAINE																																	
Caribou	624	989.8	1013.0	61	41	51.1	+2.6	85	10	28	1	0	2	38	65	2.61	-.53	.99	8	1	0	0	9.0	N	*40	NNW	24	5	11	15	6.7	45	
Eastport CO	33	1010.2	1012.9	56	42	48.9	+8.6	87	5	33	2	0	0	---	---	2.44	-.05	.62	11	0	T	0	8.6	---	---	38	NW	24	4	9	18	7.0	---
Portland	61	1009.1	1013.0	64	44	53.8	+1.5	82	10	34	*4	0	0	46	78	3.66	+3.0	1.02	12	0	.0	0	9.2	E	36	NW	24	6	8	17	6.9	55	
MARYLAND																																	
Baltimore CO	14	-----	-----	77	60	68.2	+2.9	88	26	48	3	0	0	---	---	5.62	+1.61	2.17	15	---	---	---	---	---	---	---	---	---	---	---	---	---	
Baltimore	146	1006.1	1014.0	78	58	67.7	+3.7	91	11	42	29	2	0	57	74	6.37	+2.36	1.93	15	11	.0	0	9.0	NE	42	W	13	5	11	15	7.0	50	
Frederick	294	-----	-----	76	55	65.3	+1.4	88	12	41	29	0	0	---	---	8.16	+4.56	2.00	19	7	.0	0	---	---	---	---	---	---	---	---	---	---	
MASSACHUSETTS																																	
Blue Hill Obs.	640	990.1	-----	67	48	56.4	+1.3	86	11	35	3	0	0	78	4.30	+ .80	1.11	0	2	.0	0	12.1	NW	37	NW	24	4	9	18	7.2	46		
Boston	12	1008.5	1013.0	67	50	58.4	+6.6	86	11	39	*3	0	0	47	71	5.06	+2.15	1.51	11	2	T	T	11.6	ENE	38	NE	28	5	8	18	7.3	49	
Nantucket	43	1012.9	1013.3	60	47	53.6	+1.3	70	19	39	3	0	0	49	87	1.86	-1.05	1.71	10	3	.0	0	11.3	SSW	49	SE	1	6	2	23	7.5	50	
Pittsfield	1153	962.4	1014.1	66	46	56.3	+2.0	85	10	32	4	0	1	---	---	5.30	+1.54	1.40	18	9	T	0	5.9	---	---	---	---	---	---	---	---	---	
MICHIGAN																																	
Alpena CO	587	991.5	-----	61	43	52.0	+1.1	85	10	33	*14	0	0	---	---	4.11	+1.48	1.19	9	5	T	0	10.8	---	---	42	SW	21	10	7	14	5.9	65
Detroit	619	987.1	1013.7	69	50	59.5	+1.7	86	9	40	*13	0	0	48	69	2.99	-.62	.99	18	7	T	T	8.5	E	34	SW	21	5	6	20	7.3	47	
Escanaba CO	594	991.2	-----	58	43	50.4	+6.7	73	8	33	13	0	0	---	---	2.12	-.48	.74	10	5	.0	0	10.6	---	---	43	NW	30	9	10	12	6.8	60
Grand Rapids	681	988.2	1013.3	70	47	58.7	+2.4	90	30	35	13	1	0	47	68	2.02	-1.43	.74	11	4	T	T	9.0	E	42	SW	21	5	9	17	6.7	57	
Lansing	859	981.7	1013.7	70	49	59.3	+2.8	90	30	36	13	1	0	48	69	1.75	-2.00	.58	16	6	T	T	10.1	W	54	W	21	9	9	13	6.1	57	
Marquette CO	577	986.1	-----	59	41	50.3	+7.8	84	10	31	12	0	2	---	---	3.31	+6.67	1.08	13	6	T	7	7.7	---	---	31	NW	21	7	10	14	6.5	57
Muskegon	627	990.2	1013.4	67	46	56.3	+2.0	84	30	33	15	0	0	47	71	2.53	-.29	.89	10	4	.0	0	9.2	ENE	*33	SSW	21	10	6	15	6.4	---	
Sault Ste. Marie	721	991.5	1014.4	63	38	50.8	+1.9	85	9	29	14	0	3	40	68	2.34	-.21	1.48	8	4	T	T	10.7	WNW	37	E	30	10	8	13	5.7	62	
Ypsilanti	722	985.1	1013.3	72	50	60.7	+2.5	92	30	39	14	1	0	48	68	1.41	-2.03	.34	16	6	.0	0	10.1	ENE	*30	SW	21	4	9	18	7.2	---	
MINNESOTA																																	
Duluth	1409	971.2	1012.7	61	39	50.0	+ .9	86	8	24	13	0	7	38	69	5.60	+2.43	2.07	16	5	T	T	13.5	E	56	NE	10	8	7	16	6.5	54	
Intern'l Falls	1179	968.8	1012.8	63	37	49.7	-1.2	90	7	22	13	1	8	36	63	3.46	+ .93	1.24	17	6	.4	T	9.3	---	---	---	---	---	---	---	---	---	
St. Cloud	330	979.0	1012.3	69	48	58.6	+1.1	89	29	29	13	6	1	44	62	1.92	-1.20	.60	11	5	T	T	12.2	SSE	50	SE	10	11	6	14	5.6	59	
Rochester	1017	975.3	1012.4	68	46	57.0	+2.1	91	29	28	13	1	2	43	63	2.82	-.56	1.22	11	7	T	0	9.0	SE	---	---	---	---	---	---	---	---	
St. Cloud	1034	973.6	1011.7	67	43	55.0	-2.2	86	29	24	13	0	5	43	66	2.83	-.27	1.21	11	4	T	0	7.7	NW	---	---	---	---	---	---	---	---	
St. Paul	703	981.4	1011.6	71	48	59.3	+7.7	90	29	29	13	1	2	44	61	1.64	-1.66	.51	12	4	T	T	11.0	SE	*45	SSE	10	10	7	14	5.8	---	
MISSISSIPPI																																	
Jackson	315	1002.7	1014.5	86	65	75.4	+3.1	98	27	53	7	11	0	65	74	7.12	+3.03	2.57	11	7	.0	0	7.1	S	40	S	17	12	7	12	5.5	62	
Meridian	294	1001.0	-----	86	64	75.1	+3.6	97	27	52	7	12	0	0	---	---	4.61	+6.02	1.09	11	7	.0	0	---	---	---	---	---	---	---	---	---	
Vicksburg CO	234	1004.7	-----	83	66	74.7	+1.8	94	27	55	7	8	0	---	---	10.00	+5.78	2.97	11	10	.0	0	8.5	---	---	37	SE	18	8	13	10	5.7	74
MISSOURI																																	
Columbia	778	983.7	1012.1	75	55	64.7	+1.1	93	26	41	13	5	0	53	68	2.66	-2.18	1.26	9	6</													

See footnotes at end of table.



## CLIMATOLOGICAL DATA

Table 2—Continued

MAY 1953

State and station	Pressure			Temperature										Precipitation					Wind			No. of days										
	Elevation ground	Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days 90° F or above	No. of days 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days 0.1 inch or more	Snow, Sleet, Hail	Average hourly speed	Prevailing direction	Fastest mile		No. of days							
																							Direction	Speed	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine			
NEVADA (Cont.)																																
Winemucca	4299	866.2	1014.5	52	32	47.0	-8.9	78	6	12	10	0	14	30	55	1.75	+0.91	+0.38	13	6	1.5	2	9.2	---	38	W	7	7	6	18	6.6	
NEW HAMPSHIRE																																
Concord	339	1002.4	1013.3	70	45	57.2	+2.4	90	11	30	4	2	1	46	71	3.46	+4.2	-9.10	13	2	T	0	6.4	NW	34	NW	24	3	13	14	6.9	53
Mt. Washington	6262	804.8	1018.6	42	32	37.2	+1.9	56	11	16	1	0	14	--	86	5.22	-1.10	1.70	13	1	13.8	30	23.1	W	84	NNW	25	3	12	16	7.4	47
New Jersey																																
Atlantic City CO	8	1011.5	1013.5	68	56	61.6	+2.5	83	18	46	2	0	0	--	--	6.72	+3.74	1.55	15	13	T	0	14.4	---	38	NW	27	5	9	17	6.9	46
Newark	11	1012.5	1013.6	71	55	62.8	+1.7	91	11	44	2	1	0	53	74	4.21	+4.48	1.06	16	7	0	0	8.3	E	36	NNW	27	3	8	20	7.6	--
Trenton CO	56	1006.4	1013.2	72	54	63.2	+1.4	88	11	34	2	0	0	--	--	4.68	+1.20	1.06	17	9	T	0	8.0	---	37	NNW	17	2	11	18	7.7	45
NEW MEXICO																																
Albuquerque	5310	845.6	1008.6	76	47	61.5	-3.8	94	26	34	3	7	0	24	30	.03	-1.84	.02	2	0	0	0	10.8	NNW	58	S	28	15	14	2	4.0	76
Clayton	4969	844.2	1009.4	73	44	58.3	-1.6	93	23	28	13	6	4	--	--	.92	-1.67	.43	7	5	.6	0	---	---	---	---	---	---	---	---	---	---
Raton	6379	801.9	1009.3	68	38	53.1	-2.6	90	26	18	2	1	9	--	--	1.08	-1.09	.48	9	5	1.8	2	---	---	---	---	---	---	---	---	---	---
Roswell	3612	889.6	1009.0	84	50	66.6	-1.5	102	22	36	2	13	0	27	31	.70	-1.58	.41	3	3	0	0	13.6	---	54	SW	9	15	9	7	4.4	--
NEW YORK																																
Albany	277	1009.5	1013.0	70	50	60.1	+2.6	89	11	31	4	0	1	50	73	8.96	+6.16	1.54	18	8	T	0	7.6	NNW	35	NW	18	4	7	20	7.3	46
Binghamton	858	954.6	1013.4	66	48	57.2	+2.3	84	11	37	4	0	0	49	77	3.69	-.18	.84	15	5	0	0	10.3	NW	35	N	27	2	6	23	8.3	48
Buffalo	693	985.8	1014.1	65	47	56.4	+1.0	86	12	39	3	0	0	48	78	6.39	+3.92	1.54	16	6	T	0	11.6	SW	40	SW	18	4	6	21	7.8	37
New York CO	10	1002.0	1013.0	69	55	62.1	+1.3	83	11	43	3	0	0	--	--	.417	+6.66	.87	15	10	T	0	10.1	---	45	NW	23	2	12	17	7.3	45
New York	19	1011.9	1013.7	71	55	63.2	+1.9	96	11	45	3	1	0	52	72	4.37	+1.04	.99	15	9	0	0	8.8	NE	40	NW	27	2	10	19	7.7	--
Rochester	543	994.2	1013.7	67	48	57.5	+1.1	89	11	33	4	0	0	49	77	4.14	+1.50	.56	16	7	0	0	8.7	W	47	W	18	4	8	19	7.3	43
Schenectady	217	1011.5	1013.7	71	52	61.1	+3.0	90	11	36	4	1	0	--	--	7.04	+4.66	2.03	18	6	T	0	---	---	---	---	---	---	---	---	---	---
Syracuse	399	992.2	1014.0	67	50	58.4	+7	89	11	36	4	0	0	49	73	4.35	+1.45	1.68	15	3	0	0	8.7	NNW	36	S	21	5	7	19	7.3	51
NORTH CAROLINA																																
Asheville CO	2203	942.8	1014.9	80	57	68.6	+5.2	90	23	44	8	1	0	--	--	3.53	+5.50	1.11	8	7	0	0	6.9	---	26	NW	30	9	11	11	5.7	75
Asheville	2093	942.8	1014.9	80	57	68.6	+5.2	90	23	44	8	1	0	--	--	3.53	+5.50	1.11	8	7	0	0	6.9	---	26	NW	30	9	11	11	5.7	75
Charlotte	753	987.5	1014.8	85	63	74.2	+5.9	97	31	52	9	6	0	61	67	2.64	-.34	.96	8	6	0	0	6.9	SW	30	SW	2	9	11	11	5.9	74
Greensboro	891	983.7	1015.2	85	60	72.4	+6.1	96	30	50	8	0	0	59	68	.91	-2.73	.33	8	6	0	0	7.5	SW	26	NNW	19	7	12	12	6.1	63
Hatteras	4	1014.2	1014.8	78	66	72.0	+3.8	87	26	57	29	0	0	65	80	3.77	-.16	2.14	10	12	0	0	13.1	SSW	40	SW	7	8	12	11	5.7	67
Raleigh CO	400	999.0	1014.6	86	63	74.6	+6.1	99	31	53	29	10	0	--	--	2.17	-1.48	1.22	7	7	0	0	6.5	---	22	SW	7	10	12	9	5.4	76
Raleigh	438	999.0	1014.6	86	62	73.5	+6.2	97	31	58	29	10	0	61	70	.37	-2.37	.57	5	7	0	0	7.5	SW	---	---	---	---	---	---	---	---
Wilmington	30	1013.9	1015.1	86	66	75.9	+5.9	98	26	53	29	0	0	65	74	2.60	-.83	2.26	7	8	0	0	10.1	SSW	29	SW	7	11	5	7	4.3	75
Winston-Salem	967	980.0	1014.5	84	62	73.0	+6.3	95	25	51	9	7	0	58	63	1.66	-2.27	.87	7	7	0	0	8.7	SW	30	W	6	11	8	12	5.3	--
NORTH DAKOTA																																
Bismarck	1650	951.9	1011.9	63	42	52.4	-2.3	83	6	27	12	0	4	41	70	4.40	+2.46	1.74	12	4	1.8	0	12.8	NNW	57	SW	9	5	10	16	6.9	57
Devils Lake CO	1471	958.3	1014.4	63	42	52.4	-1.6	84	7	27	13	0	4	--	--	3.59	+1.46	1.27	13	6	T	0	9.6	---	35	NE	11	8	10	13	6.4	51
Fargo	895	977.0	1011.5	65	43	54.8	-1.2	86	7	25	13	0	6	42	65	3.44	+1.20	.98	13	4	T	0	13.4	NNE	60	SW	29	7	10	14	6.1	56
Williston CO	1877	943.4	1011.9	60	42	50.9	-3.7	84	6	25	11	0	4	40	70	4.56	+2.90	1.73	13	4	3.0	1	7.7	---	37	SE	24	5	7	19	7.4	58
OHIO																																
Akron	1210	976.3	1014.3	72	49	60.7	+2.2	87	30	37	28	0	0	52	76	5.27	+1.52	2.15	16	8	T	0	8.3	N	---	---	---	---	---	---	---	---
Cincinnati	761	982.4	1013.9	77	57	67.0	+3.4	91	31	46	14	4	0	--	--	4.61	+1.07	1.08	12	3	T	0	5.9	---	22	SW	2	7	8	16	6.7	--
Cincinnati Obs.	871	982.4	1013.9	76	57	66.1	+3.6	91	26	45	9	3	0	54	70	2.59	-.86	.74	12	3	T	0	9.7	SW	---	---	---	---	---	---	---	---
Cleveland CO	663	985.4	1013.7	73	51	61.9	+2.8	90	30	38	28	2	0	0	--	--	4.32	+1.30	.76	18	3	0	0	---	---	---	---	---	---	---	---	---
Cleveland	787	985.4	1013.7	73	51	61.9	+2.8	90	30	38	28	2	0	51	71	4.00	+1.27	.83	19	8	0	0	8.8	N	34	N	30	5	7	19	7.1	48
Columbus CO	724	985.4	1013.7	73	57	65.1	-2.9	88	30	44	10	0	0	--	--	3.55	-.32	.82	13	--	0	0	---	---	---	---	---	---	---	---	---	---
Columbus	815	984.4	1013.5	76	54	64.9	+4.1	93	30	41	28	2	0	55	72	3.05	-.92	1.00	14	5	0	0	7.7	S	27	W	2	8	6	17	6.8	58
Dayton	1002	977.7	1013.8	74	55	64.3	+3.3	90	30	41	24	2	0	54	73	5.52	+1.98	1.16	11	6	0	0	8.5	SW	37	W	2	9	5	17	6.6	59
Sandusky CO	603	991.5	1013.6	70	53	61.4	+2.1	89	30	41	3	0	0	--	--	3.01	-.31	.90	14	4	0	0	6.8	---	25	W	1	6	8	17	6.8	55
Toledo	621	990.5	1013.6	71	51	60.9	+2.7	92	30	41	3	1	0	52	75	3.18	-.23	.86	12	6	0	0	10.2	ENE	36	SW	21	6	8	17	7.0	51
Youngstown	1178	971.6	1014.0	71	49	60.0	+1.7	84	11	39	24	0	0	50	74	4.56	+4.7	1.04	15	9	T	0	8.6	N	30	W	1	5	7	19	7.3	--
OKLAHOMA																																
Oklahoma City	1280	964.8	1010.8	78	58	68.3	+3																									



## CLIMATOLOGICAL DATA

Table 2—Continued

MAY 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation										Wind				No. of days		Possible sunshine																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		Station	Sea level	Average maximum		Average minimum		Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point	Average relative humidity		Precipitation				Snow, Sleet, Hail	Max depth on ground	Average hourly speed	Prevailing direction	Fastest mile	Direction	(sunrise to sunset)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
				F	°F	F	°F							F	°F		F	°F	F	°F	F	°F							F		°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F	F	°F



## CLIMATOLOGICAL DATA

Table 2—Continued

MAY 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation										Wind				No. of days (sunrise to sunset)		Possible sunshine					
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more With thunderstorms	Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		Clear	Partly cloudy	Cloudy							
												Max. 90° F. or above	Min. 32° F. or below							Total	Max. depth on ground			Speed	Direction										
																													No. of days		No. of days	Total	Max. depth on ground	Speed	Direction
Ft	Mb	Mb	°F	°F	°F	°F	°F	°F	°F	Date	°F	%	In.	In.	In.	In.	In.	In.	In.	M. p. h.	M. p. h.	0-3	4-7	8-10	%										
ALASKA																																			
Anchorage	134	1005.8	1011.0	56	38	47.3	+1.6	69	30	28	9	0	3	36	65	0.76	+0.25	0.40	5	0	T	0	5.7	NW	30	SW	30	1	7	23	8.4	54			
Annette Island	110	1009.5	1013.7	56	44	50.0	+1.1	78	24	37	10	2	0	43	78	10.36	+5.76	3.36	18	0	0.0	0	12.8	SE	*40	SE	11	3	8	20	7.9	--			
Barrow	22	1022.7	1023.2	25	15	20.1	+1.3	35	17	-1	3	0	31	17	87	.06	-.07	.03	4	0	2.4	7	12.7	ENE	25	E	22	3	6	22	8.0	--			
Bethel	21	1007.5	1008.8	54	35	44.4	+4.4	70	19	28	13	1	12	37	76	.62	-.27	.17	8	1	T	T	9.5	NW	*25	NNE	11	0	5	26	8.8	--			
Cordova	40	1009.8	1011.5	53	36	44.4	+1.1	63	29	27	7	0	6	39	79	3.97	-3.17	1.22	16	0	T	0	4.4	E	*23	E	12	2	4	25	8.6	--			
Fairbanks	436	992.2	1009.4	63	40	51.5	+4.9	76	30	30	4	8	3	35	55	.64	-.13	.33	10	2	T	0	6.3	N	22	E	11	3	7	21	7.8	--			
Galena	120	1004.4	1009.3	60	38	48.9	+6.7	72	30	27	2	2	7	36	60	1.38	+2.29	.71	8	1	.1	T	7.6	NNE	*27	WSW	30	3	10	18	7.3	--			
Gambell	25	1011.2	1012.3	32	27	29.3	.0	42	25	19	12	0	29	25	84	.50	-.11	.15	6	0	4.7	20	19.0	NE	*41	NE	19	1	0	30	9.5	--			
Juneau	15	1011.5	1012.4	58	40	49.2	+2.2	71	31	31	5	2	1	41	76	2.51	-.68	.69	17	0	T	0	8.0	E	29	SE	9	4	4	23	7.9	41			
Kotzebue	10	1012.5	1013.0	43	29	35.5	+5.9	67	30	18	11	0	26	30	81	.46	+1.2	.17	5	0	T	5	10.8	WSW	*26	WSW	12	13	12	6	4.6	--			
McGrath	334	996.6	1009.2	58	36	47.4	+4.1	73	19	26	9	2	6	38	71	1.98	+1.00	.92	10	1	T	0	5.0	S	*19	NW	11	1	6	24	8.1	--			
Nome	13	1009.5	1010.3	49	34	41.6	+7.5	63	17	24	16	0	12	33	70	.37	-.22	.16	5	0	T	0	8.8	NE	40	E	30	8	10	13	5.9	62			
Northway	1713	946.2	1009.1	60	35	47.9	+2.6	75	31	26	6	3	5	36	66	1.35	+6.2	.31	15	4	T	0	7.8	NW	*22	ESE	11	2	5	24	8.0	--			
St. Paul Island	22	1003.4	1004.6	38	32	35.2	.0	44	21	27	1	0	19	34	92	2.18	+1.00	.77	17	0	3.6	8	---	---	---	---	---	1	3	27	9.2	--			
Yakutat	28	1011.5	1012.6	52	38	44.8	+5	61	18	27	3	0	4	40	85	4.09	-3.59	.80	18	0	T	0	9.2	ESE	*39	SE	11	2	5	24	8.5	--			

Data from airport unless otherwise specified. CO indicates data from city office.

\* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

° Other dates also.

† Peak gust.

# Max. 70°F. or above for Alaskan stations.

## HEATING DEGREE DAYS

(Base 65°F.)

Table 3

MAY 1953

State and station	Current season			State and station	Current season			State and station	Current season			State and station	Current season		
	This month	Period July through this month	Long term mean July through this month		This month	Period July through this month	Long term mean July through this month		This month	Period July through this month	Long term mean July through this month		This month	Period July through this month	Long term mean July through this month
ALABAMA				INDIANA (Cont'd.)				NEVADA				SOUTH DAKOTA (Cont'd.)			
Birmingham	7	2609	2540	El Wayne	133	5883	6193	Elko	613	6708		Pierre	316	7332	7231
Mobile	0	1535		Indianapolis (CO)	62	4847	5436	Ely	687	7313		Rapid City	392	6741	7134
Montgomery (CO)	2	1884	2052	Indianapolis	79	5232		Las Vegas	60	2383		Sioux Falls	273	7596	
Montgomery	3	2126	2071	South Bend	183	6081		Reno	527	5751	5578				
ARIZONA				Terre Haute	89	5080		Tonopah	469			TENNESSEE			
Flagstaff	614	7006	7001	IOWA				Winnemucca	550	6171	6276	Bristol	26	4083	
Phoenix (CO)	5	1286	1424	Burlington	203	5923	5838	NEW HAMPSHIRE				Chattanooga	20	3258	3195
Phoenix	6	1507		Charles City (CO)	216	7290	7562	Concord	247	6602	7276	Knoxville	21	3447	3616
Prescott	317	4344		Des Moines	203	6393	6401	Mt. Washington	856	12634		Memphis	31	3062	3118
Tucson	38	1685		Dubuque	261	7077	6880					Nashville	14	3454	3607
Winslow	250	4685		Keokuk (CO)	118	5266		NEW JERSEY				TEXAS			
Yuma	0	840	1038	Sioux City	209	6973	6952	Atlantic City (CO)	116	4119	4978	Abilene	72	2286	2589
ARKANSAS				KANSAS				Newark	107	4622	5471	Amarillo	170	3941	4203
Ft. Smith	52	3361	3217	Concordia (CO)	174	5256	5392	Trenton (CO)	108	4526	5099	Austin	24	1543	1679
Little Rock	40	2929	3021	Dodge City	201	4815	5062	NEW MEXICO				Big Spring	60	2331	2637
Texarkana	30	2438		Goodland	298	6086	5679	Albuquerque	200	4282	4433	Brownsville	3	445	628
CALIFORNIA				Topeka (CO)	163	4848	5097	Clayton	277	5090	4998	Corpus Christi	2	776	971
Bakersfield	73	2112	2193	Topeka	164	5053		Raton	390	6286		Dallas	42	2191	2375
Beaumont (CO)	270	2967		Wichita	156	4474	4651	Roswell	108	3336	3576	Del Rio	9	1249	1500
Bishop	293	4180	4282	KENTUCKY								El Paso	64	2410	2531
Blue Canyon	671	5506		Lexington	41	4374	4752	NEW YORK				Ft. Worth	42	2111	2349
Burbank	105	1707		Louisville (CO)	34	4128	4376	Albany	183	6221	6637	Galveston (CO)	0	1011	1170
Eureka (CO)	394	4471	4457	Louisville	34	4128		Binghamton	255	6785	6747	Galveston	0	1047	
Fresno	127	2521	2407	Pikeville (CO)	13	3479		Buffalo	276	6107	6876	Houston (CO)	3	1137	
Los Angeles (CO)	82	1288	1476	LOUISIANA				New York (CO)	116	4446	5250	Laredo	6	724	
Los Angeles	122	1635		Baton Rouge	0	1457	1508	La Guardia Field	102	4270		Lubbock	141	3437	
Mt. Shasta (CO)	552	5549		Lake Charles	0	1337		Rochester	254	6051	6664	Port Arthur	0	1348	
Oakland	227	2783	2968	New Orleans (CO)	0	1001	1221	Schenectady	159	5944		San Angelo	61	1986	
Red Bluff	128	2530	2644	Int. Airport, Moisant	0	1113		Syracuse	225	6041	6799	San Antonio	19	1397	1446
Sacramento (CO)	143	2395	2661	Shreveport	16	2070	2132	NORTH CAROLINA				San Antonio	5	1064	
Sacramento	139	2639		MAINE				Asheville (CO)	30	3913	4035	Victoria	33	1906	
Sandberg (CO)	502	4357		Caribou	425	8920		Asheville	37	4240		Waco	69	2660	
San Diego	94	1322	1632	Eastport (CO)	530	7100	8080	Charlotte	1	2993	3251	Wichita Falls			
San Francisco (CO)	265	3030	2981	Greenville (CO)	370	8581	9245	Greensboro	7	3582	3854	UTAH			
San Francisco	289	3194	3236	Portland	341	6731	7241	Hatteras	2	2151	2510	Milford	452	6002	
San Jose	190	2337		MARYLAND				Raleigh (CO)	0	2897	3281	Salt Lake City (CO)	328	4906	5480
Santa Catalina	261	2318		Baltimore (CO)	38	3733	4432	Raleigh	3	3164		Salt Lake City	367	5341	6049
Santa Maria	274	2892		Baltimore	35	4224		Wilmington	0	2236	2403	VERMONT			
COLORADO				Frederick	65	4894		Winston-Salem	5	3313		Burlington	231	6835	7782
Alamosa	558	8559		MASSACHUSETTS				NORTH DAKOTA				VIKINGIA			
Colorado Springs	429	6280		Boston	215	5181	5870	Bismarck	390	8360	8901	Cape Henry (CO)	11	2946	3502
Denver	353	5763	5761	Milton	273	5963		Devils Lake (CO)	391	9153	10094	Lynchburg	12	3832	4001
Grand Junction	276	5527	5613	Nantucket	345	5348	5735	Fargo	331	8717	9247	Norfolk (CO)	2	2721	3359
Pueblo	274	5381	5518	Pittsfield	269	6860		Grand Forks	362	9093	9748	Norfolk	9	3067	
CONNECTICUT				MICHIGAN				Pembina	360	9107		Richmond (CO)	4	3396	3865
Bridgeport	169	5000		Alpena (CO)	403	7308	8077	Williston (CO)	433	8326	9220	Richmond	7	3616	
Hartford	164	5404	6040	Detroit	188	5846	6562	OHIO				Roanoke			
New Haven	196	5259	5833	Escanaba (CO)	445	7854	8579	Akron	157	5937	6178	WASHINGTON			
DELAWARE				Grand Rapids (CO)	216	6066	6645	Cincinnati (CO)	29	4080	4887	Ellensburg	391	7036	
Washington	67	4515		Grand Rapids	184	4464		Cincinnati	58	4779		Kelso	351	4752	
DIST. OF COLUMBIA				Lansing	195	6493	7061	Cleveland (CO)	179	5179	6088	Olympia	376	9506	
Washington (CO)	16	3742	4492	Marquette (CO)	461	7908	8531	Cleveland	129	5444		Seattle (CO)	275	2986	4370
Washington	15	3820		Muskegon	276	6562		Columbus	79	5136	5449	Seattle	383	5028	
FLORIDA				Sault Ste. Marie	435	8315	9069	Dayton	88	5274	5467	Spokane	383	5905	6271
Apopka (CO)	0	1130	1217	Ypsilanti	153	5947		Sandusky (CO)	148	5294	6053	Tatoosh Island (CO)	423	5276	5566
Daytona Beach	0	757		MISSISSIPPI				Toledo	149	5792	6246	Walla Walla (CO)	232	4135	4873
Fort Myers	0	289	284	Jackson	3	2096	2165	YOUNGSTOWN	166	5924		Yakima	306	5352	5592
Jacksonville (CO)	0	911	1125	Meridian	0	2265	2214	OKLAHOMA				WEST VIRGINIA			
Jacksonville	0	1083		Vicksburg (CO)	2	1910	2053	Oklahoma City (CO)	103	3403	3647	Charleston	25	4095	
Key West (CO)	0	40	46	MISSOURI				Oklahoma City	105	3478		Elkins	72	5458	5729
Key West	0	56		Columbia	127	4792	5029	Tulsa	91	3536		Huntington (CO)	15	3803	
Melbourne	0	481		Kansas City	149	4673	4985	OREGON				Parkersburg (CO)	29	4403	4909
Miami (CO)	0	151	181	St. Joseph	178	5363	5331	Burns (CO)	544	6459		Petersburg	27	4512	
Int. Airport, Hialeah	0	108		St. Louis (CO)	68	4193	4576	Eugene	361	4512		WISCONSIN			
Miami Beach	0	91		St. Louis	82	4483		Merced	363	4525	4578	Green Bay	339	7800	7840
Orlando	0	585		Springfield	125	4502	4557	Pendleton	314	4742		La Crosse	228	7310	
Pensacola (CO)	0	1275	1428	MONTANA				Portland (CO)	276	3764	4245	Madison (CO)	267	6877	7345
Tallahassee	0	1302		Billings	424	6275		Portland	326	4221		Madison	246	7003	
Tampa	0	525	550	Butte	685	8945		Roseburg	364	4348	4207	Milwaukee (CO)	312	6439	7054
West Palm Beach	0	189		Glasgow (CO)	455	8140		Salem	336	4485		Milwaukee	302	6682	
GEORGIA				Great Falls	480	6759		Sexton Summit (CO)	666	5837		WYOMING			
Albany	0	1668	1638	Havre (CO)	425	7525	8327	PENNSYLVANIA				Casper	503	6765	
Athens	0	2847		Helena	516	7355	7738	Allentown	132	5319		Cheyenne	503	7058	7394
Atlanta (CO)	11	2740	2963	Kalispell	460	7092	7812	Erie (CO)	232	5440	6248	Lander	542	7454	8069
Atlanta	7	2856		Miles City	442	7164		Harrisburg	71	4780	5374	Rock Springs (CO)	555	7384	
Augusta	0	2385	2272	Missoula	511	6922	7470	Park Place (CO)	206	6333		Rock Springs	613	7809	
Columbus	0	2382		NEBRASKA				Philadelphia (CO)	71	4077	4722	Sheridan	476	6883	
Macon	1	2139	2313	Grand Island	252	6184		Philadelphia	70	4325		ALASKA			
Rome	16	3229		Lincoln (CO)	193	5825	5955	Pittsburgh (CO)	49	4537	5336	Anchorage	542		
Savannah	0	1722	1628	Lincoln	196	6053		Pittsburgh	102	5215	5633	Annette Island	457		
Valdosta	0	1401		Norfolk	252	6880		Reading (CO)	71	4519	5148	Barrow	1382		
IDAHO				North Platte	299	6552	6388	Scranton (CO)	142	5454	6130	Bethel	628		
Boise	395	5360	5586	Omaha	186	6115	6217	Williamsport	116	5503	5992	Cordova	631		
Lewiston	310	4839		Scottsbluff	336	6388		RHODE ISLAND				Fairbanks	411		
Pocatello	494	6506	6576	Valentine (CO)	324	7027	7159	Block Island	285	5083	5742	Galena	491		
ILLINOIS								Providence	214	5323		Gambell	1101		
Cairo (CO)	48	3592	3941					SOUTH CAROLINA				Juneau	483		
Chicago (CO)	225	5459	6235					Charleston (CO)	0	1612	1837	Kotzebue	903		
Chicago	187	5800						Charleston	0	1930		McGrath	539		
Chicago University	230	5606						Columbia (CO)	0	2175	2457	Nome	718		
Moline	204	6357						Columbia	0	2453		Northway	524		
Peoria	172	5770	5973					Florence	0	2295		St. Paul Island	914		
Springfield (CO)	99	4865	5401					Greenville	2	2851	3043	Yakutat	620		
Springfield	123	5270						Spartanburg	2	2926					
INDIANA								SOUTH DAKOTA							
Evansville	53	4295	4417					Huron	298	7637	7870				

Data from airport unless otherwise specified. CO indicates data from city office.



## SEVERE STORMS

Table 4

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Delaware and Philadelphia Counties, Pa.	1	5 p.m.					Not available		Hail	Hail ranged to size of golf balls. Neon signs broken, paint on cars scratched. Lack of wind helped keep damage at minimum.
Trussville, Jefferson County, Ala.	1	Late afternoon			0	0	\$10,000		Tornado or thunderstorm	Storm occurred about 17 miles northeast of Birmingham. 5 homes destroyed, 1 other building destroyed and 1 damaged.
Choctaw County, Ala.	1	Late afternoon			2	3			Tornado	
Chilton County, Ala.	1	5:15 p.m.	110	1½	0	2	50,000		do	Storm occurred in Manooka Community, 3 or 4 miles south of Calera. 3 houses destroyed and 6 damaged; 6 barns destroyed.
Clay County, Ala.	1	7:30 p.m.	440	25	7	12	200,000		do	19 homes destroyed and 50 damaged; 36 other buildings destroyed and 57 damaged. Chickens killed; stripped of their feathers.
Brunson, Hampton County, S.C.	1	11 p.m. - midnight					30,000		Electrical	Fire from lightning destroyed cotton warehouse.
Lexington County, S.C.	1	11 p.m. - midnight					2,000		Wind	Uprooted tree fell across trailer truck on Highway 6.
Albuquerque, N. M.	1						500		do	Local whirlwind destroyed chicken house.
Southeast edge of Oak Ridge Reservation, Anderson and Knox Counties, Tenn.	2	3-3:30 a.m.	330		0	2	5,000		Tornado	4 homes destroyed and 4 others damaged. 2 other buildings on farm property damaged. 7 families affected.
Decatur (vicinity of), Meigs and McMinn Counties, Tenn.	2	4 a.m.	Few to 575		4	8	168,000	\$3,000	Tornado and wind	Squall line with severe thunderstorms and some tornado activity moved through Meigs and McMinn Counties. Short tornado path detected in area known as No Pone Valley, and straight line winds damaged a section 18 miles long. 3 homes completely destroyed and 58 damaged, while 55 farm buildings destroyed and 89 damaged. A total of 135 families affected.
Unicoi County, Tenn.	2								Hail	Large hailstones accompanying electrical storm damaged crops over limited area.
Watauga County, N.C.	2	7 a.m.					1,000	1,600	do	Damaged scattered parts of 15-square-mile area.
Donalds, Abbeville County, S.C.	2	Noon-1 p.m.					2,000		Wind	Uprooted trees; unroofed and damaged a residence.
Sumter, S.C.	2	6 p.m.			1	0	6,000	0	Wind (possible tornado)	No tornado formations seen, but type of damage justifies assumption.
La Plata, Md.	2	6-7 p.m.							Thunderstorm and wind	Barn collapsed; TV aeriels downed.
Montgomery County, Ala.	2	7 p.m.					6,000		Thunderstorm and hail	Hailstones as large as marbles in Snowdown area, as large as hen eggs in Pintala Community, and as large as baseballs in Flete Community. Cattle scarred and bruised by hail.
Jefferson, Orleans, and Tangipahoa Parishes, La.	2	7-8 p.m.	*2 to 3	40			30,000	Slight	Hail	Began in Kenner-Harahan area and moved through Metairie and Lakefront area of New Orleans to Slidell. Damage to greenhouses extensive; some roofs, windows, and automobiles damaged.
Napoleonville (near), La.	2	P.m.			0	0	10,000	50,000	Tornado	Some buildings and much sugarcane damaged.
East Baton Rouge, Livingston, St. Helena, and Tangipahoa Parishes, La.	2-4		*60	60	2	2	750,000	750,000	Hail, wind, and rain	Rain totaling 5 to 16 inches flooded fields, roads, and streams. 2 persons drowned in sudden flood on highway; 2 injured when car crashed during driving rainstorm. Most commercial strawberry and truck crops drowned by floods in fields. 12,000 baby chicks drowned in flooded hatchery. Amite and Natchitoches Rivers, little subject to flooding, went out of their banks. Much damage to buildings and timber by high winds during thundersqualls.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Greensville County, Va.	2	7:45-8 p.m.	100	2	0	0	\$7,500	\$0	Tornado	Hop and skip tornado hit Brink area and then jumped to Low Ground area both in southern part of County. Some 25 farm buildings including 3 large tobacco farms destroyed or badly damaged, and about 100 trees uprooted. It was reported as "a cone-shaped cloud that was picking up dirt and leaves; sounded like 20 or 30 big bombers flying right over the house".
Delafield (near), Waukesha County, Wis.	3	4:30 a.m.			3			0	Fog	3 persons killed when cars collided in dense fog.
Earle, Ark.	3	P.m.					5,000		Electrical	1 house and furnishings destroyed by fire resulting from lightning.
Grundy County, Tenn.	4	2:30 a.m.							Wind	3 homes damaged; 5 buildings destroyed and 7 others damaged. 5 families affected.
Taylorville, Smith County, Miss.	4	10:30 a.m.	200	1½	0	1	20,000	1,000	Tornado	Destroyed 2 homes and 3 other buildings, damaged several others. Funnel and debris seen by people over a mile away.
Corinth, Alcorn County, Miss.	4	11:15 a.m.			0	0	50,000	2,000	do	Destroyed 1 building, damaged several others.
Wiggins, Stone County, Miss.	4	Morning	100		0	0	15,000	2,000	do	Several homes damaged; trees uprooted, some up to 24 inches in diameter. Winds estimated up to 120 m.p.h. lasted for 3 minutes.
Gloster, Amite County, Miss.	4	Morning					5,000	500	Thunder-squall	Several buildings damaged, several other outbuildings destroyed; trees uprooted.
Donaldsonville, La.	4	12:10 p.m.					5,000	10,000	do	Several buildings and much sugarcane damaged by high winds.
New Orleans, La.	4	1:30 p.m.				2	5,000		do	48 windows broken by wind driven gravel; signs blown down injuring 2 persons; trees broken.
St. James and La- Fourche Parishes, La.	4	P.m.						25,000	Hail	
Nashville (vicinity of), Tenn.	4	2:10 p.m.					Minor	Minor	Wind	Severe thunderstorm felled numerous trees, caused minor damage to a number of homes, and damaged utility lines in Nashville and Donelson. No evidence of tornado activity.
Walshall County, Miss.	4	3 p.m.					4,000	1,000	Thunder-squalls	7 homes damaged; 3 other outbuildings destroyed.
Macon (4 miles east of), Noxubee County, Miss.	4	Afternoon			0	2	25,000	2,000	Tornado	5 homes and 6 other buildings destroyed; 10 homes and 7 other buildings damaged; trees uprooted.
Salem, Mass.	4	3:35 p.m.	2	2½	0	0	500	0	Waterspout	Storm apparently formed about 2 miles west of Salem on South River; followed course of that River to Naval Reserve dock at mouth of South River in Salem Harbor, then dissipated as it moved in direction of Marblehead. Storm lifted 30-foot lobster boat 6 inches into air, ripped off its windshield and damaged steering gear and instrument panel. Description of storm cloud fits that of "fair-weather waterspout".
Winfield (near), Marion County, Ala.	4	6:30 p.m.	67	1/5	0	2	5,000		Tornado or thunderstorm	1 house and 5 other buildings destroyed.
Bessemer (near), Ala.	4	7 p.m.			0	0			Tornado	1 person observed funnel-shaped cloud which roared, was red, yellow, and black, and moved northeastward along Warrior River.
Blount County (vicinity Knox- ville Municipal Airport), Tenn.	4	9:22-9:52 p.m.	*1½	1		4	60,000		Wind	Gusts of 100 m.p.h. accompanied thunderstorm that hit Knoxville Municipal Airport, destroying 1 house, damaging 2 hangars and a number of parked planes, as well as 20 to 30 automobiles parked near Administration Building.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Boca Raton to Boynton Inlet, Fla.	4			12	0	0	\$0	\$0	Water- spout and tornado	Moved northward from near Boca Raton to Boynton Inlet where it reached shore and dissipated.
Fairfax, Va.	5	4-7 p.m.					5,000		Electri- cal	Lightning struck television antenna on 2-story house.
Arlington and Fairfax Counties, Va.	5	4-7 p.m.					800,000		Rain	Flash floods on creeks caused damage to streets, apartments, and stores, particularly in Arlington and Alexandria. 1 apartment area was under 5 feet of water. Emergency conditions prevailed for 4 hours to concentrate on evacuation of residents from flooded homes.
Monticello, Fla.	6	8:30 a.m.			1	1			Electri- cal	Two women sought shelter from rain under tree. Lightning killed 1 instantly, but caused only slight injuries to other.
Greene, Lenoir, Craven, Pamlico and Carteret Counties, N. C.	6-7	2 p.m.— 4 a.m.	*5	70			20,000	40,000	Hail, wind, and rain	Thunderstorms moved southeastward with squall line. No evidence of tornado activity, but considerable wind damage on coast at Morehead City and Beaufort. Scattered hail damage inland.
Moore Coun- ty, N. C.	6	3 p.m.					1,000	1,000	Rain	Rained 1 inch in 15 minutes at Carthage. Crops damaged. Terraces washed.
Baltimore, Md.	6	4:20 p.m.			1	1			Electri- cal	Casualties were to men on box car.
Mt. Holly Springs and Pine Grove Furnace, Pa.	6-7	Overnight					°Several thousand		Rain and electri- cal	Sudden heavy rains caused flash flood, isolated a family which had to be evacuated by boat through waters running 5 feet deep. A number of landslides and rock falls closed highways. Other roads south toward Gettysburg had up to 2 feet of water over them. Lightning fired a barn near Gettysburg, with a loss of \$6,000.
Palestine, Ill.	7	12:40 p.m.			0	0	0	0	Tornado and hail	2 tornado funnels formed over Palestine, but did not reach surface. Hail fell in vicinity.
Havre (21 miles north of), Mont.	7	Afternoon					400		Wind	Light building destroyed by gusts.
Kenton, Har- din County, Ohio	7	Afternoon					500		Rain and electri- cal	Lightning struck home, causing minor damage. Water flooded basements in all sections of city, causing basement wall to cave in, and extinguishing gas furnaces and electrical appliance motors.
Abbeville, Lafayette County, Miss.	7	4 p.m.					0	1,000	Hail	Considerable damage to crops.
Frederick County, Va.	7	5-6 p.m.		6					do	Hail severely damaged orchard crops (apples and peaches) from point about 3½ miles west of Winchester to point about 4 miles north of Winchester. Garden crops at Hayfield also badly damaged.
Wilson Coun- ty, N. C.	9	4 p.m.						25,000	do	10 square miles damaged.
Nebraska, eastern third of State	9-10	Most of both days					200,000	Little	Winds	Damage widespread, but not severe in any 1 locality.
Anne Arundel County (northern portion), Md.	9	5 p.m.							Hail	Roof damages.
Huron, S. Dak.	9	6:05 p.m.	440	3	0	0	8,000	0	Tornado and hail	During brief thunderstorm that moved northeastward, buildings in path which included Huron Airport twisted in manner which showed evidence of small tornado. Damage consisted of 1 airport hangar 1/4 mile from Weather Bureau Airport Station, a large dairy barn and minor buildings on farmstead 1 mile northeast of hangar, and small buildings on several farmsteads further northeastward. Hail 1/4 inch in diameter fell for brief period.
Bryant, Ham- lin County, S. Dak.	9	7 p.m.	30 to 150	9	0	0	12,000	0	Tornado	Path of tornado started at Cherry Lake, moved north-northeastward to 1½ miles west of Bryant and to 3 miles south-southeast of Vienna. Buildings on 6 farms within path known to have been damaged.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Boone County (south- western portion), Nebr.	9	7 p.m.	*1 to 3	15			\$1,000	\$1,000	Hail	Many windows broken and roofs damaged.
Frederick and Car- roll Coun- ties, Md.	9	7-8 p.m.						250,000	Thunder- storm and hail	
Hanover (near), Pa.	9	Evening					°Several hundred		Wind and hail	High winds unroofed large bank barn and blew in part of front wall. Hail (peas to marble size) accumu- lated locally to 3 to 5 inches in depth, damaging young tomato plants.
Randolph (6 miles south of), Nebr.	9	9 p.m.	Nar- row	1 to 2	0	0	5,000	Little	Tornado	Several buildings damaged.
Barton Coun- ty, Kans.	9-10	9 p.m.— 2 a.m.					500	1,000	Hail and wind	Scattered hail in various parts of County caused relatively minor damage. Wind damage to sheds and small buildings noted in isolated instances. Prop- erty damage by wind \$500; crop damage by hail, \$1,000.
Republic County, Kans.	9	9:10 p.m.		13	0	0	45,000	0	Tornado	The earliest of severe storms along a squall line on night of May 9-10. Tornado first struck farm 1 mile south of Courtland in western Republic County at 9:10 p.m., passed aloft over town, then dipped to do extensive damage to at least 10 farms and minor dam- age to several others in path extending 2 or 3 miles north of Courtland to about 12 miles north-northeast of town. At least 1 house and numerous barns and sheds completely destroyed. Although this tornado last noted within 4 or 5 miles of Nebraska border, the Hebron, Nebraska, storm at 9:30 p.m. is believed to be a separate funnel cloud.
Southwest of Hebron to near Mil- ford, Nebr.	9	9:40- 10:15 p.m.	500	50	5	62	2,500,000	Consider- able	do	Much of town of Hebron destroyed, also many sets of farm buildings and 1 airport. Unknown number of people slightly injured, in addition to list.
Hebron (west and north of), Thayer County, Nebr.	9	9:45- 10:05 p.m.	*3 to 5	20			40,000	17,500	Hail	
Mitchell County, Kans.	9	10:20 p.m.			0	0	10,000		Wind (pos- sible tornado) and hail	Wind and hail marked passage of severe squall line across Mitchell County in Glen Elder and Solomon Rapids areas, with greatest damage in southeastern portion of County southwest of Simpson where a wind- storm, described by some as a "twister", destroyed or damaged several barns. Property damage \$10,000 from wind. Hail damage (to crops) not estimated.
Dawson Coun- ty (eastern edge), Nebr.	9	11 p.m.	Nar- row	1 to 2	0	0	2,000	Slight	Tornado	Large barn and several other farm buildings destroyed.
Lincoln County (eastern portion), Kans.	9-10	11:50 p.m.— 12:10 a.m.							Hail	Large hailstones up to nearly 3 inches in diameter fell for 15 minutes in village of Beverly in eastern Lincoln County. Damage mostly to gardens and roofs.
Iowa	10	Mid to late af- ternoon							Wind	Local windstorms broke out in all sections of State, except extreme west and southeast. Damage varied from minor, such as falling trees, broken power and telephone lines, and roof damage to severe damage where farm buildings completely demolished. In western Kossuth County, from vicinity of Fenton to Swea City, barns completely demolished about 3:15 p.m. In northeastern Union County, near Lorimor, and in southeastern Madison County, at Elm Grove, farm buildings demolished. In northern Buchanan County, near Hazleton and Stanly, severe damage to farm buildings. In southwestern part of State, near Red Oak and Villisca in Montgomery County, barns de- molished. Minor damage widespread.
Vinson (1 mile south- east of), Harmon County, Okla.	10	1 a.m.	440	3	0	0	1,000	0	Tornado	Moved northeastward. Several sheds, small barns, and garages scattered.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Mangum (22 miles southwest of), Greer County, Okla.	10		17	Short	0	0	\$1,000	\$0	Tornado	Tornado observed. Barn and chicken-house destroyed
Clay County, Kans.	10	1 a.m.			0	0	3,000	0	Wind (possible tornado)	Local windstorm with tornadic characteristics moved southeastward and damaged several buildings on farm 3 miles south of Clay Center and caused minor damage to other farms further south.
Seward County (northwestern portion), Nebr.	10	1:10 a.m.			0	0	500-1,000	Slight	Tornado	
Mangum (near), Greer County, Okla.	10	1:15-1:17 a.m.	17	Short	0	0	5,000	0	do	Tornado funnel observed; resembled large dust devil. Moved northeastward. Cotton warehouse shed blown down; several other buildings damaged.
Alva (8 miles west of), Harper and Woods Counties, Okla.	10	1:15-2 a.m.	880	20			1,000		Wind	Several farmsteads suffered damage. Path northeastward.
Barber County (southeastern portion), Kans.	10	1:15 a.m.			0	0	1,000	0	Wind (possible tornado)	Severe wind with tornadic characteristics, moving northeastward, destroyed shed on farm 9 miles northwest of Kiowa, a garage and top of windmill 6 miles northwest of Kiowa, and blew roofing from home at south edge of town. Debris scattered in all directions.
Thomas (1½ miles north of), Custer County, Okla.	10	1:20 a.m.	Narrow	Short	0	0	500	0	Tornado and hail	Some hail with tornado; no damage by hail. A 20x30 foot barn destroyed.
Sumner and Cowley Counties, Kans.	10	2-3:30 a.m.			0	2	34,000	0	Tornado and electrical	Storms developed along squall line in Sumner and Cowley Counties. Tornado developed in Oklahoma just south of Caldwell and occasional damage in southwest-northeast line indicates movement through, or near, Caldwell, Wellington, Oxford, and Belle Plaine in Sumner County, near Udall in Cowley County and probably dipping again in southeast Butler County where local damage to a farm suggested tornadic winds. About 10 farms southwest of Oxford and several in Wellington and Belle Plaine areas suffered damage to barns and other buildings. In Udall 3 farms west of town and Shell warehouse south of town hit. City Marshall at Udall sighted 3 funnels, 2 of which touched ground. Woman in Wellington injured by flying glass and 1 in Belle Plaine treated for lightning shock. Home of latter destroyed by fire ensuing from same lightning strike. Damage by tornado \$30,000; lightning \$4,000.
Grant County (west-central part of), Okla.	10	2:12-2:45 a.m.	*10	25			5,000	2,000	Wind	Scattered damage to roofs and windows. Crop damage to wheat in fields.
Grant County (extreme northern portion), Okla.	10	3 a.m.	Narrow	Short	0	0	Minor	0	Tornado	Tornado caused minor damage to drive-in theatre just south of Kansas-Oklahoma State Line south of Caldwell, Kans. Tornado moved into Kansas.
Blackwell (in and near), Kay County, Okla.	10	About 3 a.m.					1,000		Wind	Damage mostly to trees, signs, and power lines. Service station under construction blown down.
Northeastern Chase, southeastern Morris, northwestern Lyon and southeastern Wabaunsee Counties, Kans.	10	4-5 a.m.	Narrow	45	0	0	10,000	0	Tornado	Loud roar over Cottonwood Falls and some wind damage to roofs in east edge of town at 4 a.m. was first indication of tornado. Six miles northeast damage to farm houses, other buildings, machinery, and trees continued through 3-mile strip. 5 or 6 miles further northeast tornado again apparently dipped, destroying 2 cabins and damaging 12 others at Lake Kahola on Chase-Morris County border. In northeastern Lyon County near Bushong buildings wrecked on 3 farms, and at 5 a.m. apparently same tornado dipped northwest of Harveyville in southeastern Wabaunsee County to cause light damage along path 50 to 100 feet wide and about 4 miles long.

See footnote at end of table.

## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Cowley and Elk Coun- ties, Kans.	10	4:30 a.m.	440	1	0	0		\$0	Tornado and wind	Small tornado moving northeastward damaged buildings on 2 farms and leveled fences in eastern Cowley County near village of Cambridge. Wind damage to barn near Howard in Elk County is in southwest-northeast line from Cambridge and may have been from same tornado.
Allen County (southwest- ern por- tion), Kans.	10	5:30 a.m.	200	$\frac{1}{2}$	0	0	\$500	0	Tornado	In Petrolia, small town in southwestern Allen County, a loud roar, a demolished garage and 2 sheds, and damaged trees, roof, and communication lines gave evidence of small tornado moving northeastward.
Richardson County (northwest- ern por- tion), Nebr.	10	6 a.m.	Near- row	1 to 2	0	0	1,000	Slight	do	Several buildings unroofed.
Lennox, Lin- coln Coun- ty, S. Dak.	10	12:05- 12:15 p.m.			0	0	0	0	do	Tornado observed by "skywatcher" army filter center, and others. It did not touch ground during time it was visible to observers. Moved northeastward.
Russell- ville, Ark.	10	12:10- 12:15 p.m.	200	3	0	0	10,000	0	Tornadoes	Several persons observed 2 small funnels traveling in parallel paths and merging into 1 funnel just before reaching city. Paths extended northeastward. Several buildings damaged near fairgrounds, and 1 portable roller rink destroyed.
Vilonia, Ark.	10	12:30 p.m.					1,500		Wind	1 house badly damaged. Several garages and out- buildings unroofed.
Nebraska City (3 $\frac{1}{2}$ miles south of), Nebr.	10	1:30 p.m.	33	Short	0	0	700	0	Tornado	
Russell Coun- ty (east- central por- tion), Kans.	10	2 p.m.					1,000		Wind	Wind unroofed 3 small buildings in rural area east of Russell.
Licking, Mo.	10	2 p.m.			0	0	12,000		Wind and tornado	High winds damaged several buildings in Texas County near Licking. In connection with this disturbance, a tornado demolished a large barn on farm near Kinderpost, some distance north of Licking.
Weiner, Ark.	10	2:20-3 p.m.	440	1		5	1,000		Wind and hail	1 house damaged and 5 persons injured in Weiner area of Poinsett County. Wind general over County, but no other damage reported. Hail very light and caused no damage.
Carlisle, Ark.	10	3 p.m.					4,000		Electri- cal	1 house destroyed and 1 house damaged by lightning.
Rector, Ark.	10	P.m.					1,000		Wind and hail	Barn and truck shed damaged by wind. Hail damage negligible.
Auburn (southwest of), Nebr.	10	3 p.m.	1,760	8	0	0	10,000	Slight	Wind and torna- does	3 funnels observed which did not reach ground.
Millerton (northwest of), Wayne County, Iowa	10	3:15 p.m.			0	0	20,000	0	Tornado	Farmstead demolished. Funnel cloud observed. This may have been an early phase of Clayton County tornado.
Starbuck (vicinity of), Minn.	10	3:55 p.m.	440	20	0	0	100,000		Tornado and rains	About 35 farms damaged. Some livestock killed and much poultry perished. Many trees uprooted. Poles and wires down. On some farms nearly all buildings destroyed, while on others only slight damage occurred. There was a report of 5 funnel-shaped clouds observed about 5 miles northwest of Starbuck. First great destruction occurred about 4 $\frac{1}{2}$ miles south of Lake Emily. Storm moved northward. Last great destruction occurred west of Lowry. Path not continuous. Heavy rains accompanied storm.
Minnesota, central, southern and eastern counties	10	P.m.			1	1	150,000		Thunder- storms	A number of barns, outbuildings, silos, and windmills wrecked. Many buildings, homes, garages, barns, farm machinery, and automobiles damaged. A number of plate-glass windows blown in. Many signs, billboards, awnings, and antennae down. Many trees uprooted or branches broken off. Poles and wires down. Some livestock killed and much poultry perished. Fatality occurred in north Ramsey County indirectly attributed to storm. Heavy rains and hail accompanied storms. In Buffalo and Fairmont areas storms rather severe and assumed near tornadoic proportions.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Iowa, east-central portion	10	4 p.m.	*3	45			\$35,000		Hail	Estimated hail damage at Chelsea only. Severe hail between Lynnville in Jasper County and Dysart in Tama County, with greatest damage at Chelsea, where nearly all windows on west side of buildings broken. Hailstones size of hens' eggs reported at Lynnville up to 2½ inches at Chelsea, and irregular stones with largest diameter that of baseballs near Dysart. Hail damage also reported in nearby communities of Elberon and Vining.
Iowa, north-central portion	10	4:10-4:30 p.m.	800	28	0	3	1,000,000	\$0	Tornado	Tornado moved from approximately 5 miles southwest of Ventura to approximately 8 miles west of Northwood. 3 homes destroyed, 28 damaged; 138 farm buildings destroyed, 59 damaged. Loss of livestock heavy.
Izard County, Ark.	10	4:10-4:20 p.m.	440	2			3,000		Hail and wind	Storm moved northeastward over Zion-Franklin area of northeastern Izard County. 1 barn destroyed and several buildings damaged. Considerable damage to timber. No crop damage reported, although hailstones averaged ½ inch in diameter with some about 1 inch in diameter. Stones covered 35 percent of ground.
Chelsea (4½ miles southwest of), Tama County, Iowa	10	4:30 p.m.			0	0	20,000	0	Tornado	Farmstead demolished. This may have been an intermediate stage of Clayton County tornado. Also along projected path from Millerton to Giard were observed: a funnel cloud along highway between Pella and Oskaloosa; severe hail between Lynnville, Chelsea, and Dysart; damage to farm buildings 5 miles southeast of Independence at 5:30 p.m., and hail north of Independence.
Hollandale (vicinity of), Minn.	10	5 p.m.	60	8	6	3	35,000		Tornado, rain, and hail	A father, mother, and 4 children killed and 2 others of family injured when their home a mile south of Hollandale was lifted from its foundation and demolished. Another small house nearby wrecked and 10 adjacent small buildings damaged. A home, 4 barns, and several outbuildings destroyed, 2 automobiles damaged, and 1 personal injury occurred between Hollandale and Maple Island where last great destruction reported at Maple Island Airport. Funnel-shaped cloud reported a mile south of Hollandale. Small tornado moved east-northeastward. Heavy rains and light to heavy hail accompanied storm. Path not continuous.
Chester (near), Howard County, Iowa	10	5:30 p.m.	400	6	0	2		0	Tornado	Storm moved from approximately 3 miles southwest of Chester in Iowa to approximately 4 miles north of Chester in Minnesota. 11 farmsteads severely damaged along path. Shortly before 5 p.m. severe damage inflicted on farmstead 1 mile south of Greene in Butler County. This may have been an early phase of Chester tornado. Hail reported at Nashua in Floyd County and Lime Springs in Howard County.
Western Fillmore, eastern Olmsted, and western Winona Counties, Minn.	10	5:45-6:30 p.m.	34	48	2	17	500,000		Tornado, rain, and hail	Many buildings demolished or damaged. Hundreds of trees uprooted. Some livestock killed and much poultry perished. Extensive damage to more than 24 farms, some of which reported loss of nearly all buildings. Many poles and wires down. Storm entered State from Iowa, through extreme southwestern Fillmore County. First great destruction occurred in vicinity of Wykoff where a farmer killed in collapse of his barn. Rural schoolhouse, 3 miles south of Chatfield, lifted from its foundation and destroyed. Funnel-shaped cloud observed 1½ miles west of St. Charles, where 2 automobiles blown off road and a passenger killed. Last great destruction near Elba, where steel bridge wrecked, and severe damage to trees and buildings occurred in Whitewater State Park. Beyond Elba, to Wisconsin border, only high straight winds reported. Storm moved north-northeastward. Path not continuous. Heavy rains and hail accompanied storm.
Clayton County, Iowa	10	6 p.m.	400	6	0	0	150,000	0	Tornado	Tornado demolished or severely damaged 8 farmsteads, with heavy loss to livestock. Farmer carried 700 feet by storm, but suffered only minor injuries. Tornado moved from approximately 7 miles north-northeast of Elkader to 1 mile northeast of Giard.
Minnesota, central, southern and eastern counties	10	P.m.					20,000	30,000	Hail and rains	Light to heavy hail caused considerable damage to some early garden crops, fruit buds, and real property in places. Hailstones varied in size; some as large as baseballs reported at Pine City, where many windows broken and automobile tops punctured. In Battle Lake area, Ottertail County, ground entirely covered with hail in places and some hailstones size of golf balls. At Albert Lea, hailstones size of hens' eggs reported. Heavy rains which accompanied storm caused some additional damage.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Minnesota, southern counties	10	6:20 p.m.					\$20,000		Electri- cal	A number of places struck by lightning. A granary and machine shed in Inver Grove township destroyed by lightning-set fire. Some trees, wires, and buildings struck in Twin Cities and elsewhere in southern Minnesota. At St. Paul, a home damaged by fire after chimney struck by lightning.
Dumas, Ark.	10	6:30 p.m.					6,000		do	2 farm homes near Dumas destroyed by lightning.
Newport, Ark.	10	P.m.							Wind and hail	Screen of drive-in theater destroyed and other minor property damage. Hail damage negligible.
Wisconsin, northwest- ern portion	10	6:30-8 p.m.	100	100	4	27	1,000,000 (at least)	Minor	Tornado	Storm first observed at River Falls, Pierce County at about 6:30 p.m. Moved north-northeastward through St. Croix, Polk, Burnett, and Washburn Counties to extreme southern Douglas County. Funnel-shaped cloud observed by several persons. 1 person killed in St. Croix County, 2 in Polk County, and 1 in Burnett County. American Red Cross reported 12 homes destroyed and 101 damaged; 127 other buildings destroyed and 88 damaged. Many of the buildings were farm barns. Unknown number of farm animals killed when trapped in barns. Most destruction in rural areas. Considerable damage to rural electric and telephone lines. Many trees uprooted.
Wisconsin, northwest- ern portion	10	6:30-8 p.m.	100	100	0	10	1,000,000	Minor	do	Storm first observed in southeastern Buffalo County at about 6:30 p.m. Moved northeastward through Trempealeau, Eau Claire, Chippewa, and Taylor Counties to southern Price County. Funnel-shaped cloud observed by several persons along path. American Red Cross reported 3 homes destroyed and 47 damaged; 114 other buildings destroyed and 50 damaged. Many of the buildings were farm barns. Some farm animals killed when trapped in barns. Most destruction in rural areas. Trees uprooted and power and communication lines disrupted. Storm apparently crossed Mississippi River from Minnesota.
Vernon County, Wis.	10	P.m.					150,000		Wind	Many tobacco sheds and other farm buildings destroyed or damaged.
Galena, Ill.	10	8:30 p.m.			4				do	4 persons drowned in Mississippi River after high winds upset their small boat.
Foreman, Ark.	11	2 a.m.					500		Electri- cal	House damaged by lightning.
Lindsay, Garvin County, Okla.	11	11 a.m. - noon	*2	7			4,000		Wind	Press box in football stadium, oil derrick, and small buildings blown down.
North Little Rock, Ark.	11	1 p.m.					600		Electri- cal	Apartment building in Rose City area damaged by lightning.
Siloam Springs, Ark.	11	2-2:05 p.m.	30	100			Minor		Wind	Storm moved northeastward. Section of hall ceiling in high school building torn out. No other damage reported.
San Angelo, Tom Green County, Tex.	11	2:15 p.m.	880	2	11	159	3,239,000		Tornado and hail	In Lakeview district, 4 miles north of city, 320 homes destroyed and 199 damaged. Light hail. Storm moved eastward.
Slaty Cross- ing, Yell County, Ark.	11	4 p.m.					3,000		Electri- cal	House destroyed by lightning.
Waco, Tex.	11	4:10 p.m.	660	23	114	597	39,500,000	\$1,650,000	Tornado and hail	150 homes destroyed, 900 damaged; 185 other buildings destroyed, including 6-story furniture company; 500 other buildings damaged. Damage to modern steel reinforced buildings mostly confined to windows and doors. Heavy rain and hail. Storm formed 3 miles north-northwest of Lorena and moved to 5 miles east of Axtell. Moved northeastward.
McAlester (northwest of), Pitts- burg County, Okla.	11	Afternoon	Nar- row	Short	0	0	Minor		0 Tornado	Tornado struck near Lakes Talawanda. Several trees uprooted on several farms, but no damage to buildings.
Wynnewood (northeast of), Garvin County, Okla.	11	4:30 p.m.	33	2	0	0	500		0 do	Moved northeastward over open country. Accompanied by hail, size of marbles, but no damage.
Jewett, Leon County, Tex.	11	6:50 p.m.	300	12	0	0	48,000		Tornado and hail	Light hail. 1 home destroyed, 11 damaged; 4 other buildings destroyed, and 3 others damaged. Damage was 5 miles southwest of Jewett. Storm moved north-eastward.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Harper County, Kans.	11	7-7:30 p.m.	*3/4 to 4	30				\$500,000	Hail	Severe hailstorm with stones up to size of golf ball but generally about marble size struck in "hit and miss fashion" from southwest to northeast along 30-mile strip in western Harper County. Ground covered to depth of 2 or 3 inches in local areas and losses to wheat and other crops ranged from 25 to 100 percent. Some roofs damaged.
Monticello, Ark.	11	7:30 p.m.					\$1,000		Wind	1 house damaged.
Rotan, Fisher County, Tex.	11				0	0	0	0	Tornado	Several funnel-shaped clouds observed, but none touched ground.
Athens, Henderson County, Tex.	11	9 p.m.					2,000		Wind	Storage sheds torn down; roofs damaged.
Sulphur (in and near), Murray County, Okla.	11						3,000	1,000	Rain and hail	Rock Creek overflowed covering football field and rodeo grounds. Rain damage \$1,000. Most hail damage in Negro community south of Sulphur. Hail damage \$1,000 to roofs and \$1,000 to crops.
McCurain County, Okla.	11	Evening					Considerable		Rain	Heavy rains, unofficial amounts up to 8 inches, reported north of Broken Bow. Several roads washed out.
Ft. Gibson Dam (near), Cherokee County, Okla.	11	11:45 p.m.			1	2			Electrical	Lightning struck party of fishermen fishing from boat 100 feet from east bank, killing 1 and injuring 2.
Sedgwick County (northeastern portion), Kans.	11-12	Near midnight					800		do	Granary with 100 bushels of wheat and shed containing farm truck burned after being struck by lightning.
Louisiana, entire State, except area south of Mississippi and east of Atchafalaya Rivers	12-19				12		50,000,000	45,859,000	Rains and floods	Rainstorms widespread and intense, and flooding not confined to river systems. Heavy rains over State began on April 24-25, generally 1 to 4 inches but with amounts 3-6 inches over southern half of State. On April 28-29 heavier rains fell over northern and central portions with amounts exceeding 4 inches north of a line from Longville, Beauregard Parish, to Acme, Concordia Parish; amounts exceeding 8 inches fell in Sabine, Natchitoches, Winn, Grant, LaSalle, Catahoula, Concordia, Rapides, and Vernon Parishes, Camp Polk reporting 13.35 inches. Rains again on May 4 and 5, with amounts exceeding 4 inches in Vernon, Beauregard, Rapides, Avoyelles, Concordia, and St. Landry Parishes. From May 2 to 5, amounts exceeded 4 inches in the "Florida" parishes with 8 to 16 inches in East Baton Rouge, Livingston, Tangipahoa, and Washington Parishes. (Damages from this storm is given separately in preceding tabulation). This series of heavy rains not only resulted in serious local flooding but saturated soil so that further rains which began about 11th and continued through 18th resulted in almost complete runoff. Rainfall during this 6 to 8 day period exceeded 15 inches in Natchitoches, Grant, Winn, LaSalle, Catahoula, Franklin, Concordia, Avoyelles, Rapides, Vernon, Allen, Evangeline, Jefferson Davis, St. Landry, and Pointe Coupee Parishes; exceeded 20 inches in Rapides, Catahoula, St. Landry, and portions of Grant and LaSalle Parishes; exceeded 6 inches over remainder of State except Washington, St. Tammany and coastal parishes east of Atchafalaya River. An unprecedented flood swept down Calcasieu River. Flooding of farmlands over major portion of State west of Atchafalaya and Mississippi Rivers damaged growing crops and livestock to extent of more than 45 million dollars, with 22 million dollars damage to cotton crop alone; damage in Lake Charles estimated at 10 million dollars; highways suffered heavily with damages estimated at more than 2 million dollars; many railroad beds washed out by rampaging streams and rivers.
West Fork Community, Washington County, Ark.	12	10 a.m.					2,000		Electrical	House severely damaged by lightning.
Albion Mich.	12	Late morning and afternoon					3,000		Rain	Rain of 3.21 inches flooded many basements.

See footnote at end of table.

## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Mulberry, Ark.	12	Noon					\$1,500		Electri- cal	1 house extensively damaged.
Hartville, Stark County, Ohio	12	Afternoon	*1	1				\$25,000	Hail	Hailstones up to 1 inch in diameter damaged leaf crops ready for first harvest at Hartville Truck Gardens.
Shiloh Com- munity (10 miles south of Sheri- dan), Grant County, Ark.	12	2:15-2:30 p.m.	440	2½			1,500		Wind	Storm moved southeastward damaging 1 house, 1 barn, and several shade trees. Damage to field crops and timber negligible.
Rison, Ark.	12	2:40-3 p.m.	880	½			17,500		do	Storm moved southeastward. Greatest damage in half block area north of railroad. Blacksmith shop heavily damaged, 34 roofs damaged. Damage to crops negligible.
Macedonia, Ark.	12	3 p.m.					500		do	Garage destroyed.
Bradley Coun- ty, Ark.	12	4-5 p.m.	*2	16			5,000	65,000	Hail and wind	Principal damage in Blue Springs, Hope Well, and Cen- terpoint Communities in northwestern part of County. Stones averaged 1½ inches in diameter, and some 7 inches in circumference reported. Stones completely covered ground to depth of 2 inches. Damage to tim- ber, tomatoes, pastures, oats, cotton, corn, and gardens.
Grant Par- ish, La.	12	8-8:30 p.m.	*2	28	1	3	35,000	10,000	Thunder- squall	Moved from Cloutersville through Colfax to Dry Prong. Colfax observer states that it definitely was not a tornado. Old condemned church collapsed, killing 1 and injuring 3 other persons. Remainder of damage to glass, roofs, and timber.
Winnfield, Winn Par- ish, La.	12	9-9:45 p.m.					*5,000		do	
Clark Coun- ty, Ky.	13	2:30-3 p.m.	880	2			10,000	2,500	Wind and hail	Trees uprooted, barns blown down, equipment damaged, and windows broken. All grain crops damaged, 80 percent of damage by wind and 20 percent by hail.
Madison County, Ky.	13	3:30-3:50 p.m.	175	2			10,000	5,000	Wind	1 tobacco barn destroyed; several other buildings either destroyed or damaged. 20 acres of barley in fields ruined. Other damage to orchards and to- bacco beds.
Williams- port, Md.	13	4 p.m.					4,000		Electri- cal and hail	Eight purebred cows killed under tree by lightning.
Chambers- burg, Pa.	13	Evening					Several hundred		Rain	Half-hour heavy rain flooded some sections with up to 5 feet of water; marooned a family in their car; damaged basements.
Lincoln County (southern part), Tenn.	14				0	0	Slight		Tornado	
Marion, Limestone, Walker, and Madison Counties, Ala.	14	Afternoon			0	2	31,000		Winds, thunder- storms, or tor- nadoes	
Adair Coun- ty, Ky.	14	2:15-3:10 p.m.					25,000	15,000	Wind and hail	Considerable damage to trees, wheat, oats, vegetable gardens, and tobacco plant beds. A garage lifted from its foundation; roofs stripped from several houses; considerable damage to school. 85 percent of damage caused by wind, 15 percent by hail.
West Point, Clay and Monroe Counties, Miss.	14	2:30 p.m.			0	1	20,000	1,000	Tornado	Several homes and other buildings destroyed; many other buildings damaged.
Middletown, Pa.	15	Early morning					1,000		Electri- cal	Lightning ripped a 5-foot square hole in roof of new home, with fire and water damage resulting.
Beaufort County, N.C.	15	3 p.m.						6,000	Hail	Light damage over area of 30 square miles.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Acadia and St. Landry Parishes, La.	16	3:30 a.m.	150	20	0	3	°\$150,000		Tornado and rain	Developed as thundersquall near Church Point and struck Lewisburg, near Opelousas, and moved to Port Barre where it dissipated. Definitely a tornado at Lewisburg. Several homes destroyed; warehouse wall blown out; oil derrick blown down.
Holly (south of), Colo.	16	1-2:30 p.m.	15	11				\$10,000	Hail and wind	Moderate to heavy hail and fresh winds occurred over area of approximately 170 square miles, 12 to 27 miles south of Holly. Hailstones size of peas to marbles; greatest damage to growing grains.
Crockett (near), Houston County, Tex.	16	2:30 p.m.		5	1	3			Tornado	Struck Porter Springs Community, 7 miles southwest of Crockett, then moved to Wesley Chapel. 12 homes destroyed, 18 damaged. 32 other buildings destroyed, 6 others damaged. Moved northward.
Eureka, Mo.	16	Afternoon				2			Electrical	2 children stunned by lightning, but were revived. Both suffered burns.
Morris County (south- western portion), Kans.	16	3:15 p.m.	220	2½	0	0	1,200	0	Tornadoes	Funnel cloud, first sighted aloft about 2½ miles southwest of Burdick moving northeastward, dipped about 1 mile south of town to destroy a hen house and remove shingles from another building. Cloud lifted as it neared town and dissipated. Second funnel, seen east of Burdick moving eastward, did not touch ground.
Wake County, N. C.	16	5 p.m.					1,000		Thunder- storm	Wind damaged drive-in theater and barns.
Rison, Ark.	16	5:30 p.m.						2,000	Hail	Principal damage to tomatoes.
Columbus, Ind.	16	P.m.	*1			2	100,000		Wind and rain	Path of storm from southwest. First area struck by storm was about three miles southwest of center of Columbus. 360-foot radio tower blown down and numerous trees and limbs fell in northeasterly direction, some of them striking houses and other buildings. Second damaged area was in East Columbus about 4 miles east-northeast of area first hit. Here roofing torn loose on windward side of numerous houses, trees and outbuildings damaged, and a few garages and outbuildings destroyed. More than 30 houses also damaged, some severely. At nearby Terrace Lake roofs blown from at least 15 other houses. Wind damage estimated at 90 percent and rain 10 percent.
Winn Parish, La.	16	6-7 p.m.	200	25	0	0	°100,000		Tornado and rain	Developed at Black Lake and moved through Dodson to Sikes. Damaged or destroyed a number of buildings; destroyed large amount of timber; severed power and communication lines.
Greenwood, Caldo Parish, La.	16	Evening	50	2	0	0	°20,000		Tornado	Brief but definite tornado. Several homes destroyed; timber and power lines downed.
Natchitoches Parish, La.	16	Evening					°15,000		Thunder- squall	Developed in Powhatan and moved to Campti; may have been storm from which Winn Parish tornado developed.
Quitman- Chatham area, Jack- son Parish, La.	16	Evening	100	20	0	2	°100,000		Tornado	Schoolhouse at Quitman badly damaged; several large buildings destroyed; number of homes destroyed or damaged.
Haskell County (south- western portion), Kans.	16	Evening							Hail	Heavy hail north and west of Satanta damaged wheat on at least 6 farms up to 100 percent. No hail fell in Satanta, but roar of storm could be heard in town. Hailstones had not all melted by morning. Storm centered about 4 miles north of Satanta.
Richland and East Carroll Parishes, La.	17	1-2 a.m.	100	30	0	17	°150,000		Tornado	Moved from 4 miles east of Rayville to 3 miles south of Lake Providence where it crossed into Mississippi swamplands and was lost.
Catahoula Parish, La.	17	3 a.m.			0	1	°25,000		Thunder- squall	Many homes in Sicily Island damaged.
Lerchday, Concordia Parish, La.	17	3:15 a.m.			0	0	°50,000		do	
Gordon (16 miles southeast of), Nebr.	17	1:35 p.m.	Narrow	5	0	0	0	0	0 Tornado	Path through sparsely settled range country, nothing of value in path.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Cumberland County and Harrisburg area, Pa.	17	Afternoon				1			Rain and wind	A Camp Hill boy nearly drowned when he slipped into open storm sewer. Section of school roof and part of 1 wall ripped off by wind 6 miles southeast of Shippensburg. Oak tree fell on adjoining structures, causing \$2,500 in damage. Girl in Carlisle injured when she walked into side of car during storm. Water across highways in many low areas slowed or caused traffic to detour. Many basements flooded; some gardens washed. Wall of Dickinson College building in Carlisle fell into basement power plant. Trees uprooted throughout area.
Fauquier County, Va.	17	2:30-3:30 p.m.		6	0	0	\$3,000	\$0	Tornado, rain, and electrical	Tornado formed near Marshall High School and moved eastward through Zula and almost to Halfway. Funnel alternately rose into the air and dipped to earth. Big trees ripped up and considerable damage done to at least 1 farm. Storm accompanied by a cloudburst which flooded roads and streams in thinly populated area and by lightning which killed 9 or more head of cattle.
Potosi, Mo.	17	3 p.m.	1,500	8			1,000	1,500	Hail	Most damage confined to 2 farms. Crop damage was to small grain, hay, and pasture. Property damage to roofs and windows. Storm moved eastward.
Perryville, Mo.	17	4 p.m.	1,500	15			6,000	60,000	Hail and wind	2 old barns blown down, and some damage to other buildings. A total of about 3,000 acres of small grain and hay destroyed or damaged. Storm moved eastward.
Mottville and Con- stantine, Mich.	17	4 p.m.		6	0	0	4,000	0	Tornado	Small tornado damaged a few trees at Mottville then moved northeastward up river picking up 4 various small buildings. Power plant at Constantine had door and several windows and part of roof ripped off. Nearby car thrown 40 feet.
Montgomery County, Md. and District of Columbia	17	4 p.m.					500		Electrical and wind	Lightning hit chimneys. High winds downed TV aerials.
Starkey (Crescent Hights), Roanoke County, Va.	17	5:30-5:35 p.m.	880	1	0	0	8,000	0	Tornado	Buildings and outbuildings damaged; several hundred trees wrung off 10 to 20 feet above ground and several large trees uprooted.
Union Coun- ty, Ky.	17	5:30-5:50 p.m.	*5	10			150,000	50,000	Hail	In Uniontown it was reported that not 1 home or business place escaped some damage. Holes knocked in roofs, windows smashed, and merchandise considerably damaged. Automobiles looked as if they had been "beaten by a hammer". Utilities disrupted. Crops in fields damaged badly.
Henderson County, Ky.	17	6-6:15 p.m.	*7	20			150,000	250,000	do	Hail ranged in size from hen eggs to goose eggs. Extensive damage to windows. In Corydon, practically every building damaged to some degree. Furniture inside of homes damaged by hailstones coming through broken windows. Merchandise in stores ruined. Several automobiles damaged; automobiles looked like they were "worked over with a set of ice picks". Utility services disrupted. Grain hard hit, with rye and barley practically destroyed. 2/3 of peach and apple crops destroyed.
Lincoln Par- ish, La.	17	P.m.			0	0	10,000		Thunder- squall	
Baltimore, Md.	17	9 p.m.							Electrical	Lightning hit chimney; debris fell on parking lot.
Little Rock, Ark.	18	6:20 a.m.					8,000		do	1 business building severely damaged by lightning.
Buchanan and Dickinson Counties, Va.	18	All day			1		50,000	10,000	Rains	Boy drowned when he fell into swollen creek near his home at Guesses Fork. Much damage to creek-bank crops reported from all sections. At Haysi and Grundy business sections flooded, and landslide blocked 1 street in Haysi. A few small bridges washed out.
Cherie- Wenche com- munity, Ail- len Parish, La.	18	Noon				1	5,000		Tornado	Small and brief tornado destroyed 1 home and damaged several others.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Johnston and Wake Counties, N. C.	18	1 p.m.					\$7,500	\$62,700	Hail	Golf-ball size hail reported. Damage in area of 15 square miles, mostly in Johnston County.
Galveston, Tex.	13	1 p.m.	16	2½	1	2	15,000		Wind and hail	Baby twister formed 6 or 7 miles southwest of city, and passed over island. Gusts up to 84 m.p.h. at Airport. Mostly flimsy buildings damaged. Hail moderate, size up to ½ inch in diameter.
Cuero, DeWitt County, Tex.	18						Extensive		Hail	5 miles southwest of Cuero; damaged windows, gardens, roofs, and crops in Ratcliffe section.
Corpus Christi, Tex.	18	Afternoon			0	0	0	0	Tornado	During squall line passage, funnel-type cloud observed by Pontiac Refining employees north of city. Cloud did not touch ground. Small tornado reported from Pawnee.
St. Helena Parish, La.	13	1:30 p.m.			0	0	5,000	Slight	do	Passed over mostly wooded areas.
Forestburg, Montague County, Tex.	18	5:15 p.m.	1,320	2			3,500	3,000	Wind and hail	Hail size of golf balls. Hail damage, \$5,000; wind damage, \$1,500.
Lunenburg County, Va.	18	6:30-7:15 p.m.							Hail	Hail size of golf balls and smaller damaged tobacco and small grains.
Ardmore (near Lake Murray), Carter County, Okla.	18		Narrow	Short	0	0	Minor	Minor	Tornado, hail, and rain	Tornado observed and photographed. Trees uprooted. Accompanied by hail and heavy rain.
Allison and Achille (near), Bryan County, Okla.	18	8-9 p.m.	1,760	5			1,500	8,500	Hail	Damage to oats, corn, cotton, and pastures.
Natchez, Miss.	18				2	3	60,000	10,000	Rain and wind	2 men drowned, 3 persons injured, and 2 homes damaged when an earth slide occurred.
Warren, Hands, Rankin, Claiborne, Copiah, Simpson, Jefferson, Adams, Franklin, Lincoln, Lawrence, Wilkinson, Amite, and Pike Counties, Miss.	18						20,000	100,000	Thunder-squalls	Main force of thundersqualls struck in this area. Brookhaven, McComb, and Summit reported hail and high winds; trees and several farm buildings destroyed and damaged. At Hazlehurst all power lines out and several buildings damaged. At Jackson 1 home damaged and trees uprooted.
Beaufort, Bertie, Gates, Hertford, Tyrrell, Martin, Washington, Franklin, Granville, Nash, and Sampson Counties, N. C.	19	1-4 p.m.					15,000	180,000	Hail	Widespread thunderstorms moved in advance of cold front. Greatest loss to tobacco in Martin County.
Payette County, Idaho	19						Little		do	All prunes in area around Fruitland and New Plymouth marked by hail. Apples suffered only negligible damage.
Orland, Calif.	19	1:30 p.m.					5,000		Wind (tornadoic)	Freak "twister" which blew itself out after about 2-mile course resulted in wrecking of 120-foot long shop building of Lambert Chevrolet plant at Orland. Several shop employees at work in building at time wind came in through open east side. It carried away sliding doors that made up most of west wall, and with them uprights supporting a heavy beam running length of building on that side. Building stayed up for a few minutes while employees drove out several cars before west wall gave way and roof collapsed. From Lambert Garage wind went northwest hitting Aletto building at 8th and Mill Streets. It lifted roof about a foot and then set it back down again doing very little damage. Wind also picked

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Orland, Calif. (Cont'd.)	19									up a chicken house and set it down without doing much damage. Some milk cans were picked off truck nearby. Lambert Shop, building is located only 100 yards north of scene of a "tornado" old timers remember.
Warrington (near Pensacola), Fla.	19	7:30 p.m.	17	** 100	0	0	\$3,000	\$0	Tornado	Storm moved northeastward. Considerable damage to small skating rink and minor damage to several dwellings.
Muscogee County (northwestern portion), Ga.	20	11-12 a.m.	*2-4	15			1,000	Little	Wind and hail	Storm moved north-northeastward from Columbus over unsettled non-agricultural section; damages mostly at Columbus. High winds of near 60 m.p.h. blew down portion of baseball park fence and caused other miscellaneous damages. Heavy hail as large as 1 to 1½ inches in diameter fell at Columbus and 10 to 12 miles to the north-northeast; losses in and near Columbus about \$500 to green-houses, windows, etc.
Norfolk (west of), Nebr.	20	4:30-5 p.m.	830	1			250	2,500	Hail	
Sargent, Co- weta County, Ga.	20	5:05-5:25 p.m.	200	** 500			1,000	200	Wind and hail	Storm moved northeastward through village of Sargent, 6 miles northwest of Newnan. High winds unroofed several homes and demolished 6 garages, also blew down numerous trees that tore down some power and telephone lines in falling. Heavy hail, measuring 1/4 to 3/4 inch in diameter, broke out windows of some homes causing resultant rain damage to furnishings. Hail also damaged cotton and garden crops.
Ben Hill (5 miles west of), Fulton County, Ga.	20	5:30-5:45 p.m.	400	5			2,000	1,000	do	Storm occurred about 10 miles southwest of Atlanta, or 5 miles west of Ben Hill, moving northward. High winds blew down a number of trees, 1 of which fell on and heavily damaged an automobile; moderate wind damage to roofs of buildings. Hail about ½ inch in diameter resulted in no losses to property but caused substantial losses to grain fields.
Atlanta, Ga.	20	5:30-6 p.m.					1,000		Wind, electric- cal, and hail	2 residences damaged when trees struck by lightning were blown over by high winds; roofs and porches of 2 other homes damaged by falling trees (Northside Drive Section). High winds or falling trees downed utility lines in several areas, disrupting services. Moderate to heavy hail also fell without causing damage.
Nemaha County (southern portion), Nebr.	20	7-7:30 p.m.	*2	8			Slight	5,000	Hail	
Wisconsin, southern portion	20-21	Night					500,000	Slight	Wind and hail	Wind damage from Lafayette County eastward to Lake Michigan and northeastward to Washington County. Uprooted trees, disrupted power and communication lines in Madison, Kenosha, Racine, Milwaukee, and other cities. Farm buildings damaged in rural areas. Some barns demolished. Slight damage to crops by hail.
Story, Mar- shall, Tama, Ben- ton, Linn, Jones, Du- buque, Delaware, Buchanan, Black Hawk, Grundy, Hardin, Franklin, Butler, Bremer, Fayette, Chickasaw, and Floyd Counties, Iowa	20	Night			1				Wind	In Waterloo man crushed to death in his bed by falling tree. Damage throughout 18-county area varied widely, with severe damage to farmsteads reported in vicinity of Almaral in Delaware County, Julien and Dubuque County, and near Elgin in Fayette County. Light damage reported from numerous localities, with trees down and interruptions to power and telephone circuits general. Outside of 18-county area, light scattered damage reported from Estherville in northwest to Fort Madison in southeast. In extreme northwest, heavy rains caused severe erosion of crop land.
Story, Har- din, Butler, Floyd, Chickasaw, and Howard Counties, Iowa	20	9-10:25 p.m.	400	125	1	0		0	Tornado	Path not continuous. First struck farmstead 2½ miles west and 1 mile north of Gilbert. Struck next at Hubbard in Hardin County where extensive damage occurred. Most extensive damage was to farmsteads in vicinity of Ackley, Vilmar, Bassett, and Alta Vista. It skipped most of Howard County, but damaged 2 farmsteads west-southwest and southwest of Lime Springs. Death resulted from heart attack to farmer working in fields when storm struck.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Iowa, east-central portion	20	10:10-11:10 p.m.	400	72	0	7	\$300,000	\$0	Tornado	Estimated property damage in vicinity of Cedar Rapids only. Storm first demolished a barn in vicinity of Chelsea, then moved a little north of east and caused extensive damage at 10:25 p.m. just north of Blairtown where barns on 6 farms and 4 cabins of motel demolished. Severe damage at Fairfax and to large motor truck establishment just west of Cedar Rapids on Highway 30. Tornado then passed over Cedar Rapids at roof-top level, damaging roofs, demolishing garages, and severely damaging large furniture establishment. Trees blown down, breaking power and telephone lines. From 5,000 to 6,000 telephones out of service in Cedar Rapids. Tornado came to surface again in eastern Linn County and moved eastward across southern Jones County, inflicting severe damage to 10 farmsteads in vicinity of Martelle, Morley, and Wyoming. It is estimated that 23 farmsteads severely damaged in course of storm.
McCammon (vicinity of), Bannock County, Idaho	21	Late forenoon and afternoon							Wind	Trees uprooted. Minor structural damage.
Saline County (south eastern portion), Nebr.	21	5:30-5:50 p.m.	*5	10			250	500	Hail	
Mesa, Adams County, Idaho	21-22								do	Hailstorms of 15 to 20 minutes duration on both days did slight damage to young pears; other crops not far enough advanced to sustain damage.
Bath, Mich.	21	2 p.m.	30	Short			500		Wind	Thunderstorm struck tool shed turning it 180° and pushed barn to leaning position at farm on Center Road 2 miles northeast of Bath.
St. Johns, Mich.	21	2:30 p.m.					4,000		Electrical	Lightning struck home 2 miles south of St. Johns on U. S. 27. Fire consumed structure and contents.
Port Huron and Smiths Creek, Mich. (Also: Sarnia, Nairn, and St. Marys, Ontario, Canada)	21	4:21-7 p.m.	*1/5 to 1 1/2	90 center-tire length	2	68	2,500,000	0	Tornado	Tornado struck first at Smiths Creek then moved east-northeastward 8 miles. After turning east it struck south edge of Port Huron, crossed into Sarnia, Ontario, then travelled east-northeastward to Nairn. From there course was nearly northeastward and dissipated south of Stratford, Ontario. Tornado apparently had 2 or 3 funnels projecting downwards which later apparently merged in Port Huron residential district. Speed of movement between 30 and 40 m.p.h. Width of path 1,200 feet near Smiths Creek to about 1 1/2 miles in Port Huron. Widest point appeared to be where course became easterly. In St. Clair County American Red Cross reported 90 homes destroyed, 300 damaged, and 83 other buildings destroyed and 124 damaged. (In Ontario Province, Canada, 4 deaths, 50 injuries, and \$15,000,000 property damage reported).
Greenford, Mahoning County, Ohio	21	9 p.m.			0	0	\$50,000		Tornado and hail	Hail size of golf balls. Noise like express train and jet plane.
Buffalo and vicinity, N. Y.	21-22	Night							Electrical, wind, and rain	4 houses struck by lightning with total damage estimated at \$750. Streets and some basements flooded by heavy rain. Trees in some sections blown down, disrupting telephone and electric lines.
Columbia, Mo.	21	11 p.m.					25,000		Electrical	A large residence struck by lightning and destroyed by fire with most of its contents.
Wayne County (south eastern portion), Nebr.	22	1:30 a.m.					500-1,000	Slight	Wind and hail	Wind damaged small area; some hail occurred.
Louisville, Stark County, Ohio	22	Early a.m.					4,000		Rain	Damage from flooding waters similar to those at Hillsboro, except confined to property mostly.
Hillsboro, Highland County, Ohio	22	3-5 a.m.					\$500		do	2.24 inches of rain in 2 hours flooded roads, fields, and basements.
Moline-Rock Island area, Ill.	22	3 a.m.					3,000		Thunderstorm	Wind tore roof off 1 home, damaged a few other structures, and brought down utility wires.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Iroquois County (northern half), Ill.	22	7:30 a.m.	*10 to 15	30		31	\$900,000	\$100,000	Wind and hail	Storm approached tornado in severity, but no funnel observed and path too wide for tornado. 2 homes demolished, 83 others damaged, and a large number of other structures suffered damage. Hail fell to depth of over 3 inches in some localities. Wind damage \$800,000, hail \$200,000.
Benton County eastward and south-eastward through White, Carroll, Cass, and Howard Counties, Ind.	22	7:55-9 a.m.	*2	60		6	1,000,000	200,000	Wind, hail, and rain	Windstorm first struck near Earl Park in Benton County not far from Indiana-Illinois border. General direction of path was eastward from Earl Park to Lake Freeman south of Monticello. From there damage path took southeasterly direction through Carroll County to just southwest of Kokomo. Although main path of storm was about 2 miles wide, damage was county-wide in 1 or 2 counties. Wind unroofed or severely damaged houses, destroyed barns and other outbuildings, killed some livestock, destroyed large sections of electrical lines, and severely damaged or uprooted trees. Hail described as "size of walnuts or golf balls" stripped leaves from trees, pounded crops and vegetation into a litter which was blown against buildings by wind. Wheat and gardens total losses. Damage estimated about 75 percent by wind and 25 percent by hail. Thousands of chickens killed by hail.
Erie and Lawrence Counties, Pa.	22-23	Overnight					Several thousand		Rain	In Erie area sudden heavy rains flooded streets and underpasses, and marooned cars. Gardens and fields suffered heavy washing. Near New Castle bridge pier collapsed from effects of erosion and flooding.
McKean, Warren, Elk, and Cameron Counties, Pa.	22-23	Overnight							Electrical and rain	Several areas isolated by rising waters; some families evacuated; small bridges washed out; trains delayed; many highways covered with up to 3 feet of water. Traffic halted by intensity of rainfall. Basements flooded. Lightning set fire to at least 1 building. Power out in some sections for as much as 6 hours. In Emporium area, cellars under several feet of water, streets flooded, 3 small bridges washed out. Gardens and fields severely washed. Some landslides occurred onto highways. Railroad tracks undermined. Sheffield, Kane, and other communities also suffered from heavy rains, with basements, streets, fields, and gardens flooded. At Kane, 3.5 inches of rain fell in about 2 hours, and lightning struck and damaged equipment. Losses in Ridgway were from flooded basements, clogged sewers, washed-out gardens, and other rain damage. In Johnsonburg, 75 homes and 25 businesses flooded with up to 30 inches of water on first floors. Schools closed and plants shut down. 70 families evacuated at Kane and others at Sheffield. Newspaper estimates gave \$10,000 damage to Ridgway, and \$200,000 damage to Johnsonburg, where it was reported as second worst flood in their history.
Union, Northumberland, Columbia, and Luzerne Counties, Pa.	22-23	Overnight					Many thousand		Electrical, rain, and wind	Near Laurelton, large shed and home damaged by high winds, trees felled, power and telephone wires downed. Power outages up to 5 hours in length. Heavy rains flooded cellars and damaged gardens. Power dam damaged to extent of \$2,000 by heavy rains. In Catawissa area lightning damaged transformer with loss of \$300, and streets littered with debris. In Wilkes-Barre area, lightning damaged school roof and knocked out three 66,000-volt transmission lines simultaneously. High winds downed trees and wires. Heavy rains flooded streets, several of which were undermined and heaved by flow of water.
Valley View, Pa.	23	11:10 a.m.	25	$\frac{1}{2}$	0	0	3,500	550	Tornado	Tornado moved east-northeastward. Damaged buildings and crops.
Roger Mills, Woodward, and Devey Counties, Okla.	23	Evening					Considerable		Wind	Over large area, minor wind damage occurred to quite a number of buildings.
Pender County, N. C.	24	2 a.m.					25,000	107,000	Hail	40-square-mile area damaged.
Millersburg and vicinity, Iowa County, Iowa	24	6:45 a.m.	Narrow	Short	0	0		0	Tornado and rain	Funnel cloud observed 2 miles west of Millersburg. Extensive damage to buildings in town and to nearby farmsteads. Heavy rains in vicinity.
Alta Vista, Chickasaw County, Iowa	24	11:30 a.m.							Hail	Hailstones as large as baseballs reported with many 1 inch in diameter. Ground covered. Hail size of golf balls also reported at Floyd in adjacent county.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Coasts of Massachusetts, New Hampshire, and southern Maine	24	All day			2				Northwest gales	2 men drowned, 6 more thrown overboard, and some 150 others towed to safety as strong northwest gales whipped waters off coast. Coast Guard and police boats kept busy all day answering calls for help. In Maine, gale winds whipped up 24 woods fires, the worst of which swept over 100 acres.
Wyoming, northeastern portion	24	Afternoon				1	\$3,000	Light	Wind	Hanger and 2 airplanes damaged at Buffalo. Steel granary damaged at Corlile. Some standing timber uprooted or broken off in Black Hills region.
Wibaux, Mont.	24	4 p.m.	400	7	0	0	10,000		Tornado and hail	Hail 1/4 to 1/2 inch in diameter. 3 separate tornado funnels from about 4 miles west of Wibaux to 4 miles east with most severe one in the middle. Middle funnel struck east edge of town. Damaged several buildings and residences. 1 residence south of Wibaux twisted off its foundation.
Missoula, Mont.	24-25	Night							Snow	Trees and shrubbery damaged.
Worthington (vicinity of), Minn.	24	P.m.					10,000		Thunderstorm	Several farm buildings wrecked. A brooder house on farm south of Worthington blown 300 feet. Heavy rains accompanied storm.
Minnesota, extreme southwestern counties	24-25	P.m.—a.m.					150,000	\$125,000	Rain and flood	Excessively heavy rains that accompanied severe thunderstorms flooded many basements, streets, ditches, roads, and highways. Bridges and culverts washed out. Buildings, homes, furniture, merchandise in basements, barn machinery, and fences damaged. A number of homes under water and several families in low sections were evacuated. Many acres of farm lands in low places inundated. Much lodging, washing, drowning of crops, and soil erosion. Considerable replanting of crops necessary. Creeks overflowed and lakes and streams in immediate area reached their highest level of spring season thus far. At St. James, 4.32 inches of rain recorded, most of which fell in about an hour.
Lackawanna, N. Y.	25-26						1,000,000		Rain	Flash floods from heavy rain flooded basements of 1,000 homes and business places as creeks overflowed into streets. Traffic stalled and utility services disrupted. In some homes water rose about 1 foot over first floor.
Milwaukee and Ozaukee Counties, Wis.	25	9:30 p.m.					25,000		Hail	Principal damage to greenhouses. Some hail clusters large as baseballs.
Pittsburgh, Pa.	26	Early morning					Several hundred		Wind	High winds damaged scores of trees, downed power, telephone, and trolley wires, and hampered traffic.
Jefferson, Centre, Elk, and McKean Counties, Pa.	26	Early morning					Many thousand		Rain	Heavy rains in Punxsutawney area flooded streets, highways, cellars, and hundreds of acres of farm land. Philipsburg reported 3.7 inches of rain in 9 hours. Streets flooded; gardens washed; auto traffic halted at Milesburg by flooded highways. 5-day rainfall totalled 6 inches at Kane. Waters not as high as on 23d in Kane-Ridgway area.
Perry, Dauphin, Cumberland, Adams, York, and Lancaster Counties, Pa.	26	Early morning							Electrical and rain	Near Hanover lightning struck transformer bank, causing plant to close for a day. In York, power out for 4 hours locally when lines hit by lightning. Heavy rains flooded streets and gardens. In Elizabethtown area, power service to 1,400 and telephone service to 400 users affected during storm. Lightning fired large barn with resultant loss of \$25,000, struck several homes, started small fires, and killed several cows. Heavy rains severely washed roads, gardens, and fields. In Mechanicsburg, streets, fields, and gardens badly washed, and basements and low first floors flooded. In Highland Park scores of basements and some streets flooded, result of rains of 17th, 23d, and 26th. Thousands of dollars damage reported from New Bloomfield area when cellars and first floors flooded from heavy rains and backed-up sewers. In Harrisburg many low-lying streets had a foot or more of water on them; many basements and gardens flooded.
Shamokin, Pa.	26	Early morning					Many thousands		Rain	A series of 3 early morning rains washed hundreds of tons of culm from coal mines into streets, yards, and gardens for distance of several blocks. Streets closed and yards cluttered with 1 to 5 feet of culm. At least 2 cars marooned and surrounded by culm that flowed like lava. Lawns, shrubbery, and gardens buried.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Glacier National Park, Mont.	26				2	2			Rain	Fresh snowfall loosened by heavy rain, and avalanche struck crew of 4 men engaged in snow removal operations.
Mitchell County, Kans.	26	Afternoon					\$1,500		Wind and rain	Wind accompanying rain caused property damage in Beloit area, particularly to an auto salvage business north of town.
District of Columbia and vicinity	26	3-4 p.m.	1,760	15		4	208,500		Hail	Unusually large hailstones; some 3 inches or more in diameter.
Clinton, Md.	26	3-4 p.m.	200	1			3,500		Tornado	Indications of tornado verified by Weather Bureau meteorologist.
Douglas County (southeastern portion), Nebr.	26	4:30-4:50 p.m.	880	3			Slight	\$25,000	Hail	
Pemiscot County, Mo.	26	7 p.m.			0	0	0	0	Tornado	Tornado funnel reported by residents of Cottonwood Point, Cooter, and Steele.
Nemaha County (central and southeastern portions), Nebr.	26	7:15-8 p.m.	*1 to 2	6 to 8			Light to moderate	6,000	Hail	
Jefferson County (southwestern portion), Kans.	26	Evening							Hail, wind, and rain	Torrential local rain, hail, and wind in and near town of Perry broke many windows, tore off tree limbs which broke telephone wires as they fell, and damaged garden and truck crops.
Franklin County (northern portion), Kans.	26	8-8:45 p.m.	*1	15 to 20		1	75,000		Hail	Heavy hail from northwest of Ottawa near County line south-southeastward over Ottawa, continued south and east for 5 or more miles. Stones up to 3 inches in diameter in some localities nearly covered ground and damaged greenhouses, roofs, neon signs, and gardens. Man suffered brain concussion when hit on head by hailstone.
Paola, Miami County, Kans.	26	10-11 p.m.					1,500		Hail and rain	Hailstones up to 2½ inches in diameter accompanied a 1.61-inch fall of rain and broke glass at greenhouse, damaged roofs, and destroyed gardens in south part of Paola.
Buffalo County (southeastern portion), Nebr.	26-27	Midnight	Narrow	Short	0	0	1,000	0	Tornado	Small buildings and wagon box full of corn between house and barn destroyed, neither house nor barn damaged.
Ottawa and Lincoln Counties southeastward to northern Butler County, Kans.	27	Early a.m.					3,000		Rain, hail, and wind	Heavy, washing rains and local areas of damaging hail and wind occurred in central Kansas, causing much loss of crops and soil damage. Wind 3 miles east of Brookville in western Saline County damaged small buildings on 3 farms. Hail between Marquette and Lindsborg in northwestern McPherson County resulted in considerable wheat loss. Damage not estimated except \$3,000 from wind in Brookville area.
Clearmont, Wyo.	27	2 p.m.	880	3				500	Hail	Principal damage to gardens, fruit trees, sugar beets, and alfalfa.
Denver and vicinity, Colo.	27	3:30-4 p.m.	10	20			90,000	30,000	Hail, wind, and rain	Over scattered areas severe hail, heavy rain, and strong winds. Hailstones, ranging in size up to 2 inches in diameter, damaged airplanes at Buckley Naval Air Station, also windows, greenhouses, flowers, and crops in several sections to extent of approximately \$120,000.
Rawlins, Decatur, western Norton, northeastern Thomas, and northern Sheridan Counties, Kans.	27	4-10 p.m.			0	0	16,600	635,000	Rain, hail, wind, and tornadoes	1 tornado near Rawlins-Decatur County line, occurring about 5 p.m., destroyed barn, mills, 2 towers, and small buildings, damaged 120 trees, uprooting 20 of them, and took out fences. Another tornado about 3 miles southwest of Dresden did slight damage to 1 farm. Besides record flooding on Prairie Dog Creek, rains that ranged up to 12 inches locally washed crops from fields and caused much soil erosion. Hail in various localities damaged growing wheat severely. Tornado damage to property \$14,500, crops none; wind damage to property \$2,100, crops none; hail damage to property none, crops \$135,600; water damage to property none, crops \$500,000.

See footnotes at end of table



## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Stevens County (southeast- ern por- tion), Kans.	27	Early evening			0	0		\$0	Tornado	Small "twister" struck 2 farms southeast of Hugoton, demolishing barn and cowshed and breaking windows in other buildings.
Roswell (5 miles east- southeast of), N.Mex.	28	1:12 a.m.	100	1/4			\$5,000		Thunder- squall	Demolished hay barn and broke power lines.
Denver, Colo.	28	3-3:15 p.m.	8	12			200	500	Hail and rain	Hail and heavy rains principally in southeastern section of Denver and in Aurora and Englewood. Transportation slowed temporarily, and streets flooded in the lower sections.
Carbon County (north- ern por- tion), Wyo.	28	3-4 p.m.					500	Light	Hail	Principal damage to broken windows.
Carlsbad (6 miles north of), N.Mex.	28	3:30 p.m.							do	Hail damaged roofs and wiped out cotton on several farms.
Sugar City, Colo.	28	4-4:30 p.m.	2	5				10,000	do	Hailstones $\frac{1}{2}$ to 1 inch in size and accumulated to several inches deep on ground. Damage limited to sugar beets and small grains.
Sherman and Cheyenne Counties, Kans.	28	5-7:15 p.m.	*2 to 5	70			5,000	60,000	Hail and wind	Hail driven by strong wind fell in varying degrees of intensity from southwestern Sherman County about 15 miles southwest of Goodland north-northeastward into Cheyenne County, its path there passing $2\frac{1}{2}$ miles west of Bird City and ending about 12 miles north of Bird City. Stones generally small with a few as large as walnuts, but their destructiveness intensified by accompanying strong wind. In Cheyenne County, wind caused some roof damage along storm path. Property damage of \$5,000 by wind; crop damage of \$60,000 by hail.
Haswell, Colo.	28	5-7 p.m.	8	20			1,000	50,000	Hail	Hailstones ranged in size from $\frac{1}{2}$ to $\frac{3}{4}$ inch and accumulated on ground to depth of 2 inches. Damage greatest to headed and ripening grains.
Southern Clay, northern Wilkin, and northwest- ern Otter- tail Coun- ties, Minn.	28-29	P.m.-a.m.			1		50,000	125,000	Rain and flood	Excessively heavy rains that accompanied severe thunderstorms flooded many basements. Several roads, bridges, and culverts washed out. At Lawndale, 500 feet of railroad tracks washed out and 7 freight cars of a 65-car train derailed. Many fields under water. Much lodging, washing, drowning of crops, and soil erosion. Considerable replanting of crops necessary. 1 death, indirectly attributed to heavy rains, when a motorist drowned in water-filled ditch near Kent, after his automobile left highway. Lakes and streams in immediate area reached their highest level of spring season thus far. At Pelican Rapids, Ottertail County, 4.44 inches of rain recorded. Unofficial rainfall of 8 inches at Kent, Wilkin County, reported.
Weston Coun- ty, Wyo.	28	7 p.m.	440	30	0	0	50,000	1,000	Tornado and hail	Storm hit several ranches in area, but missed all populated areas. Principal damage confined to ranch buildings, metal granaries, fences, and communication lines. Some damage resulted from hail following tornado.
Rochford, Pennington County, S. Dak.	28	8 p.m.		15					do	Hail, 1-1/4 inches in diameter, damaged roofs and windows in Rochford and destroyed 50,000 board feet of timber in area east of Gimlet Creek. Evidence shows that tornado that started at Newcastle, Wyo. moved into this area.
Decatur Coun- ty (south- eastern portion), Kans.	28	Evening					500		Wind	Wind, described by some as tornadic, destroyed chicken house and moved barn from its foundation 4 miles east of Dresden.
Wallace Coun- ty, Kans.	28	Evening							do	Severe wind, accompanying a thunderstorm, damaged several buildings on farm southeast of Sharon Springs.
Hamilton County, Kans.	28	Evening							Wind and hail	Wind and hail in Hamilton County was most damaging in 2 areas: (1) Southeast of Coolidge where roofs and small buildings damaged, windows broken, and wheat riddled on several farms. (2) From Syracuse to a few miles northeast where similar damage occurred on farmsteads. Neon signs, windows, and flat roofs of business buildings suffered in town.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Seward County (southern portion), Kans.	28	8:40 p.m.	50	** 100	0	0	\$39,600	\$0	Tornado	Tornado moving from southwest severely damaged 30-unit motel and partially constructed cafeteria in south Liberal. No other buildings hurt, but path of upturned shingles marked course of storm toward motel. Roofs ripped off at least one-half of the units, and others extensively damaged.
Vega, Oldham County, Tex	28	9 p.m.	880	8			6,000	2,000	Wind	Windmills and granary damaged. Small buildings overturned.
Fairfield, Mont.	29	1:30 a.m.	900	1			100,000	Light	Hail	Hail golf ball to egg size broke many windows, damaged roofs, dented cars, and destroyed many neon signs. Light damage to crops on nearby farms.
Sheridan County (eastern portion), Wyo.	29	1 p.m.	*2		0	0	0	0	Tornado	Storm occurred over open range country and no damage resulted.
Fordor, Colo.	29	Afternoon					500		Wind	Strong southwesterly winds caused some blowing soil and limited damage to farm buildings.
Western Kiowa and southeastern Ford Counties, Kans.	29	Late afternoon			0	0			Hail and tornado	In strip from west-central Kiowa County to southeastern Ford County hail severely damaged wheat. Small tornado struck town of Bloom in Ford County, destroying several buildings.
McLaughlin, Corson County, S. Dak.	29	3:45-4 p.m.	90	$\frac{1}{2}$	0	2	100,000	0	Tornado	7 business buildings and 2 homes damaged or destroyed. In addition, some cars damaged and numerous window panes in other homes blown out. 2 injured were small boys hit by debris plus being rolled along ground. Path toward northeast.
Clark, Coddington, and Hamlin Counties, S. Dak.	29	7:30-10:30 p.m.					40,000	0	Wind and tornado	70 to 80 m.p.h. winds developed, destroying buildings and machinery in counties listed. Funnel-like clouds reported in vicinity of Conde and Wallace.
Richland County, N. Dak.	29	Evening			0	0	5,000	0	Tornado	Struck farm 5 miles south of Wyndmere, leveling a 70-foot barn. No other damage reported.
Morton County (southeastern portion), and Emmons County (northwestern portion), N. Dak.	29	8 p.m.	600	20	2	20	80,000	0	do	First struck southwest of Fort Rice and moved northeastward destroying almost the entire town of Fort Rice. It cut a swath perhaps 600 yards wide through trees as it crossed Missouri River into northwestern Emmons County. Only intermittent damage occurred east of River. Red Cross reported 16 homes destroyed and 14 damaged, 43 other buildings destroyed and 9 damaged. Cars and machinery damaged. Little or no crop damage reported. This tornado associated with same storm that produced tornado at McLaughlin, S. Dak. It is not believed to be same tornado, however.
Phillips County, Kans.	29	8:30 p.m.	* $\frac{1}{2}$	Short	0	0	7,600	0	Wind (possible tornado)	Wind, possibly tornadic, struck about 1 mile south of Phillipsburg, destroying a drive-in screen, windmill, small farm buildings, and telephone cable.
Hall County (northeastern corner), Nebr.	29	9:30 p.m.			0	0	Several thousand	0	Tornado	Set of farm buildings destroyed.
Franklin County (southwestern portion), Nebr.	29	9:45-10:30 p.m.	*2 $\frac{1}{2}$	12			7,850		Wind	
Beardsley (vicinity of), Minn.	29	9:50 p.m.	*1 $\frac{1}{2}$	7			10,000		Thunderstorm	A number of small farm buildings, silos, and windmills demolished or damaged. Storm moved northeastward.
Willow Lake, Clark County, S. Dak.	29	10 p.m.		15	0	0	10,000	0	Tornado	Buildings on 5 farmsteads damaged, some demolished. Path of tornado north-northeastward.
Cass County (northern portion), N. Dak.	29	11 p.m.	100	3	0	0	8,000	0	do	Struck about 2 miles east of Gardener and moved northward, destroying some and damaging other buildings on 3 farms.
Wormleysburg, Pa.	30	Early morning				4	Not available		Rain	Bus driver and 3 passengers injured when bus skidded backward through guard rail on wet highway.

See footnotes at end of table.



# SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Fayette, Somerset, and Bedford Counties, Pa.	30	Afternoon and evening					Many thou- sands		Electri- cal, rain, and hail	In Uniontown area, hail broke over 500 glass panes in greenhouses, neon signs, and damaged paint on cars. Heavy rains and hail damaged wheat and barley in fields and gardens. Lightning killed 3 cows and damaged a house, TV set, and radio set, and knocked out power and telephone lines. Near Meyersdale about 1:30 p.m. hail fell which measured $\frac{3}{8}$ to $1\frac{1}{2}$ inches in diameter. Lightning struck and killed 10 cows. In Everett-Bedford area heavy rains flooded trailer camp and some highways. 4 persons evacuated by boat. Thousands of dollars damage reported from washing of fields and gardens by heavy rains.
Freeport, Natrona, and Acme- tonia areas, Pa.	30	Afternoon and evening					Not available	Not available	Rain	Flash flooding from heavy rains flooded basements in this area. Navigation on the Allegheny halted on 31st when water overtopped lock walls.
Stutsman County (southern portion), N. Dak.	30	Afternoon			0	0	\$10,000	\$0	Tornadoes	5 tornado funnels observed by local pilot in vicinity of Millerton and Ypsilanti. 2 reached ground, doing damage on at least 2 farms where 4 barns reported destroyed. Same pilot also reported seeing another funnel southeast of Mapleton. It dropped out of cloud then trailed back in horizontal position for nearly a mile. It disintegrated without ever reaching ground. It was type of day that normally we would not expect severe weather. Clouds scattered and generally more like fair weather cumulus than storm clouds. However, clouds that produced the tornadoes were intensely black in contrast to surrounding clouds.
Clark (near), Wyo.	30	Afternoon	* $1\frac{1}{2}$	4			10,000	Light	Wind	Most of damage confined to buildings, automobiles, and trees.
Bayfield, Wis.	30	Afternoon					100,000		Rain	Heavy rain caused dam to break. About 25 city blocks flooded and 1 street washed out. Much sand and debris deposited in area.
Baltimore, Md.	30-31								Winds	Disabled and damaged several small boats.
Orange Coun- ty, Va.	30								Hail	Considerable damage to crops and property in eastern section of County.
Louisa Coun- ty, Va.	30	3 p.m.							Wind	Many thousands of dollars of damages by storm of "almost tornadic proportion" in southern section of County.
Richmond, Va.	30	3:50-4:30 p.m.					100,000		Wind and electri- cal	Several homes in South Richmond rendered roofless. Trees of all sizes down; 500 telephones put out of commission. Lightning struck circuits at 2 substations; widely separated parts of city and adjacent counties blacked out for hours.
Wisconsin, northeast- ern portion	30	P.m.							Wind	Scattered wind damage, mostly to trees and wires from Fond du Lac to Washington Island. Some damage to docks from tidal wave reported at Washington Island.
Detroit (metropoli- tan area), Mich.	30	6-10 p.m.	15	30			620,000	30,000	Thunder- storm	Severe thunderstorms continuous for practically 4 hours. Hail fell from 8 to 8:15 p.m., averaging $\frac{3}{8}$ inch in diameter with some $1\frac{1}{2}$ inches and conglomerated up to 4 inches. Hail covered 10 to 90 percent of ground. Damage from hail estimated at \$530,000; from high winds \$100,000; from lightning \$10,000; from flooding \$10,000.
Garden City, Mich.	30	7-8 p.m.			0	0	7,000	0	Wind and water- spouts	Severe thunderstorm struck garden peninsula, blowing down 5 barns and doing other miscellaneous damage. Several waterspouts formed off peninsula as storm approached.
Blairsville- Bolivar area, Pa.	30	9 p.m.			0	0	Many thou sands		Tornado, rain, and hail	Tornado moved east-southeastward through this area. Garage blown apart; roofs damaged; chimneys, trees, wires, and TV antenna damaged. Power outages lasted up to 15 hours. Heavy rain, wind, and hail severely damaged gardens and crops in local areas.
Harbor Springs, Mich.	30	9:30- 10:30 p.m.					10,000		Thunder- storm	During severe storm, water level in Little Traverse Bay rose 55 inches above normal and receded to 33 inches below normal. Boats and water front property damaged or destroyed.
Burlington and sur- rounding areas, Kans.	31	7 a.m.		7					Hail	Hailstones up to size of golf balls fell for 30 minutes in northern part of Burlington and to north and east of town, accumulating to depth of 2 to 3 inches. Gardens, trees, roofs, and oats damaged; cattle injured.

See footnotes at end of table.

# SEVERE STORMS

Table 4—Continued

MAY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Johnson County, Ky.	31	2:30-3 p.m.	165	•• 330			°\$1,000		Wind	1 house moved from its foundation. 2 garages partially wrecked. Some damage to vegetable crops and fruit.
Carteret, Craven, Greene, and Robeson Counties, N. C.	31	4-5 p.m.					20,000	\$150,000	Hail	Most damage to tobacco in Greene, Craven, and Carteret Counties.
Milton and vicinity, W. Va.	31	4-4:45 p.m.							Wind and rain	Roof ripped off 3-story building; garage building wrecked; trees blown down.
Charleston and vicini- ty, W. Va.	31	Late af- ternoon							do	Roof ripped off building and part of brick wall damaged; cinder-block addition to machine shop destroyed; power lines snapped; television antennae blown down; automobiles damaged by falling trees; 7 fires caused by fall of power lines.
Whitesville and vicini- ty, W. Va.	31	Late af- ternoon							Wind, hail, and rain	Hail destroyed gardens and pounded holes in roofs of houses.
Crab Orchard and vicini- ty, W. Va.	31	5:30-6 p.m.							Wind and hail	Utility lines blown down. Buildings and gardens damaged by hail. Estimated \$1,000 damages by wind to drive-in theater.
Peterstown and vicini- ty, W. Va.	31	5:30-6:40 p.m.							Wind, hail, and rain	About \$1,500 damages by wind and rain to new Peterstown high school and gymnasium. Gardens destroyed by hail; window panes broken by hail in several homes; roofs of several homes and barns damaged by wind, and television aerials blown down.
District of Columbia and Dis- trict Heights, Md.	31	8 p.m. to midnight					1,200		Electri- cal	House set on fire.
Waterloo, Md.	31	Night			1				do	House set on fire; occupant burned to death.
Johnson County, Kans.	31	Night							Hail	Hailstones, ranging from $\frac{1}{2}$ to 2 inches in diameter, fell at Naval Air Station at Olathe, damaging fabric-covered surfaces of several fighter planes.

• Miles instead of yards.

•• Yards instead of miles.

° Crop damage included with other property damage.



# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

MAY 1953

Disastrous floods struck twice during the month in Louisiana and east Texas streams. The overflows on the Nezpique and Calcasieu Rivers were the highest of record. Near record stages occurred on the lower Sabine River. In contrast to floods and high water western Texas was experiencing drought conditions. Record low stages were reached on the Guadalupe and Rio Grande Rivers.

Severe flooding occurred in tributary streams in the Republican and Smoky Hill Basins during the latter part of May.

**HUDSON BAY DRAINAGE.**—Heavy rains to the south of Fargo, N. Dak. on the morning of the 29th caused the Red River of the North to rise in the reach from about 35 miles south of Fargo to north of Fargo. The Wild Rice River of North Dakota rose also and contributed significantly in raising the stage of the Red River at Moorhead, Minn. to a crest of 23.9 feet on the evening of June 1. The flood stage of 17 feet was reached at Moorhead on the morning of May 30 and it crested on June 1 at a stage of 23.9 feet. The South Fork of the Buffalo River was out of its banks at Barnesville, Minn. but the town was not threatened. Floods other than those caused by the spring thaw seldom reach the magnitude of this flood. Exceptions are the flood on May 13, 1950, with a stage of 24.9 feet and the highest summer crest of 28.6 feet on July 12, 1916.

Rainfall up to 8 inches fell in the area bounded by Gálchutt, N. Dak., on the south to Christine, N. Dak., on the north, and from Walcott and Colfax, N. Dak., on the west to Pelican Rapids, Minn., on the east. Unofficial rainfall amounts of 8 inches at Kent, Minn., and 7.5 inches at Gálchutt, N. Dak., were recorded with 4 to 6 inches elsewhere in the above mentioned area. Fargo, Moorhead, Wahpeton and Fergus Falls each received less than an inch.

Farm lands 20 to 35 miles south of the Fargo-Moorhead area and particularly on the North Dakota side from Christine to west of Wahpeton in Richland County were completely flooded as drainage ditches and Red River tributaries ran bankfull and higher. Farmers in this area were seriously affected and the crop outlook for some of the farmers is very poor. Several washouts occurred on the Great Northern Railroad's main line south of Barnesville, Minn., causing one derailment with seven freight cars overturning. Several roads were washed out and heavy concrete culverts swept downstream by the rushing waters. Farm homes near the Red River had flooded basements as did about 20 to 30 homes in Fargo-Moorhead, most of them in Moorhead. A dozen families in Moorhead in the Coulee and Elm Street areas were evacuated as water surrounded their homes. A local golf course and park were inundated but damage was slight with cleaning of debris the major problem. One death was indirectly attributed to the flood as a motorist plunged into 13 feet of water in a ditch after leaving the highway when driving into a flooded underpass near Kent, Minn.

**ATLANTIC SLOPE.**—The Connecticut River exceeded flood stage three times during the spring of 1953 at Hartford, Conn., the first time during March, the second time in the latter part of March and the first of April, and finally again in the beginning of May. The primary cause of the high river stages was the record breaking rainfall which fell throughout the district during the month of March. This rainfall was fairly general

throughout New England and at most places all time rainfall records for March were broken. Had it not been for the fact that spring snow cover was below normal and also that the Connecticut River and most of the tributaries below White River Junction were free of ice, very serious flood conditions would probably have occurred.

Heavy local rains during the evening of the 5th in the Washington, D. C. Metropolitan Area caused severe flash floods on creeks in Alexandria and Arlington, Va. and southeast Washington. In Alexandria and Arlington the sudden torrents swelled streams, overran highways and so engulfed neighborhoods that police had to man row boats for rescue work. There were no reported drownings but damage to streets, apartments and stores were estimated between \$500,000 and one million dollars. Presidential Gardens, an apartment development, was under 5 feet of water. The damage in the Nation's Capitol was confined to the southeast section where Oxon Hill Run went on a rampage and washed out the Southern Avenue bridge at South Capitol Street. The rainfall during the 4-hour period averaged around 4 inches in the 40 square mile area extending from Annandale, Va. through Alexandria, Va. to Silver Hill, Md. The heaviest rainfall amount reported was 5.5 inches, at Blue Plains, D. C. 1-1/2 miles southeast of Alexandria.

The flooding in the Altamaha River Basin during May was due mostly to the torrential rains on April 30 in the upper Ocmulgee and Oconee River Basin. On that date Monticello, Ga. reported 5.52 inches, Jackson Dam 3.43 inches and Milledgeville, Ga. reported 6.76 inches. Rain continued with minor interruptions through the 8th. During the nine day period the rainfall in the upper basins averaged 6 inches. Runoff in the Ocmulgee Basin between Macon and Jackson Dam was estimated at approximately 3.5 inches. The Ocmulgee River at Macon, Ga. rose to flood stage (18 ft.) in 10 hours from a stage of 5.5 feet at 8 a.m. on April 30. It crested shortly after midnight at a stage of 23 feet.

No material damage resulted from the flooding on the Savannah and Ogeechee Rivers in Georgia between the 6th and 24th.

**EAST GULF.**—Prolonged heavy rain during the latter part of April and the first week of May caused floods in the Apalachicola River system. Rainfall averaged 4 to 5 inches in the middle and upper part of the basin and light in the extreme south. Flood stage was not reached in the upper portion of the basin but other points reported from 1 to several feet above flood stage. Flooding was confined to low farm land resulting in little or no material damage.

Severe flooding resulted in the upper Choctaw-whatchee River from the heavy to excessive rains (4.25 inches) during the period from April 29 - May 3, 1953, with flood stage exceeded by 10.7 feet at Newton, Ala. The overflows in the lower Choctawwhatchee River were moderate. The principal damage from the overflows was to highways, bridges, camps, etc. along the river. Two persons were drowned in southern Barbour County on the night of the 2d when their automobile plunged into a swollen creek where the bridge had washed out. The light flooding in the upper Conecuh River Basin was due to the additional heavy to excessive rains that occurred on the 5th and 6th.

The flooding on the Alabama River between the 5th and 15th was due to heavy rain during the

# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS--Continued

MAY 1953

period from April 29 to May 5th. Rainfall averaged 2.5 inches over the basin during the 24-hour period ending on the morning of April 30. Severe local flooding occurred in Loundes and adjoining counties in Alabama from the heavy rain on the 2d and 3d. Severe local flooding also occurred in Dale, Henry and Houston Counties in extreme southeastern Alabama from the same storm. On the 5th, 5.8 inches of rain was reported at Troy and 6.6 inches of precipitation at Union Springs, Ala. Severe local flooding resulted in all local streams in Bullock, Pike, Macon, Montgomery and southern Tallapoosa Counties.

The heavy rains (3 inches) over the headwaters of the Warrior and Tombigbee Rivers on April 30th, and the moderately heavy rains on May 3d and 4th caused light flooding on the Warrior River on the 1st and light to moderate flooding on the Tombigbee up to the 23d of May. Only minor damages resulted from the flooding.

The heavy thundershowers during the period from the 3d to the 4th prolonged the flooding along the Pearl River in Mississippi. Additional general rains during the period from the 13th to the 19th produced excessive runoff from local areas above Monticello, Miss. to produce the highest crest of the season.

Upper Mississippi Basin.--Heavy rains over the headwaters of the Mississippi River during the closing days of May caused slight flooding in the Aitkin, Minn. area which continued into June. Only minor damages resulted.

Missouri Basin.--The Sun River overflowed lower sections between Simms and Great Falls, Mont. between May 25 and May 31 causing minor damage to truck gardens and inundating portions of State Highway No. 20. The Milk River overflowed near Glasgow, Mont. on the 30th and 31st. Only minor damages resulted.

The heavy rains (2 inches) over the North Branch of the Elkhorn River on the night of 9-10th caused overflows from Pierce, Nebr. southward to about 3 miles north of the City of Norfolk. Flood stage at Pierce was exceeded by 1.2 feet. Damage was not heavy as most spring crops had not yet been planted.

Heavy thundershowers during the night of April 29-30 caused light flooding along the Grand River at Sumner, and Brunswick, Mo. during the beginning of May. The rainfall averaged around 1 inch over northeastern Kansas and northern Missouri with local amounts of 2.5 inches southeast of Kansas City, Mo. Another series of thunderstorms during the night of May 4-5 gave rainfall totals averaging nearly 1 inch which resulted in flooding again at Sumner and Brunswick, Mo.

Severe flooding occurred in tributary streams in the Republican and Smoky Hill Basins during the latter part of May. Prairie Dog Creek at Norton, Kans. in the Republican Basin reached a record breaking stage of 25.6 feet, 8.6 feet above flood stage on the 28th, and was preceded by a phenomenal rise of approximately 17 feet in less than an hour shortly before the peak was reached. The highest stage of previous record was 23.65 feet on July 12, 1951. This severe flood was due to heavy thundershowers that began in northwest Kansas during the middle of the afternoon of May 27 and which moved eastward to the Prairie Dog drainage during the evening. Four-inch rains occurred over an area in excess of 500 square miles with 8-inch rains over about 100 square miles. Unofficial

reports of over 11 inches, occurred in the Oberlin-Achilles-Rexford-Dresden Area. Twenty-five families were evacuated from lowland homes at Norton early on the 28th. The water plant was prevented from flooding by sandbagging. Upstream from Norton, at Jennings and Clayton, there was also some flooding. Gypsum Creek at Gypsum, Kans. in the Smoky Hill Basin was flooded almost as badly as in 1951. The high water from Gypsum, Spring and Hobb Creek contributed to the severe flooding. The heavy thundershowers which caused the overflows began about midnight on the 26-27th and continued for 5 to 7 hours. A precipitation survey by Kansas Division of Water Resources indicates that all but a few square miles of the entire watershed received more than 4 inches of rain and that there were two small 8-inch centers, one located near the headwater of the creek about 15 miles south of Gypsum and the other 2-3 miles south of the town.

Ohio Basin.--Flash floods occurred in all of the smaller streams in the headwaters of the Big Sandy River on the Levisa and Tug Forks between the 18th and 20th. The Levisa Fork rose to 12 feet at Grundy, W. Va. at 10 p.m. on the 18th and receded to 2.5 feet by early the next morning. It rose again to 12 feet by 11 a.m. on the 19th. Most of the damage was on smaller creeks which were unable to carry the flow and spread out over the narrow valleys, damaging the houses built along the creek banks and small bridges. There were a large number of earth and rock slides along the highways. A small child was drowned in a creek near Grundy, W. Va. Heavy rainfall in the area of Gary-Bluefield-Welch, W. Va. on the Tug Fork of the Big Sandy River caused the creeks and smaller streams to leave their banks. The only reported damage was in the town of Welch where a large creek flows into Tug Fork. Some houses along the river were damaged. Most of the damage was caused by slides along the highways and railroads. Very light damage resulted from the overflows on the Levisa Fork, at Pikeville, Ky.

Heavy rain (4 inches) from the 15th to the 19th caused 3 to 7.5 foot overflows along the middle and lower reaches of the Green River in Kentucky between the 18th and 30th.

Heavy thundershowers during the night of 21st and the morning of the 22d caused minor flooding at Bourneville, Ohio, on Paint Creek and at LaRue, Ohio, on the upper reaches of the Scioto River. Some low places on highways were temporarily closed by the high water.

The slight flooding on the Wabash and White Rivers during the last decade of the month was due to rainfall which began on the 12th. The rainfall averaged about 0.5 inch per day for an entire week (0.75 to 1 inch on the 15th). On the 22d heavy rains averaging about 1-1/4 inches fell over a narrow section of the central part of Indiana drained by the West Fork of White River and over a section of the Wabash from Montezuma to Lafayette.

The moderate to heavy rain over the Tennessee Basin from the 4th to the 6th caused minor flooding on the Tennessee River at Florence, Ala. The additional flooding on the Tennessee River at Gilbertsville, Ky. from the 19th to the 21st was due to moderate to heavy rain on the 18th and 19th. Some flooding occurred in the upper reaches of the Clinch River from the heavy thunderstorm activity on the 19th.



# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS—Continued

MAY 1953

**White Basin.**—The White River was above flood stage at Clarendon, Ark. for the entire month and at St. Charles from the 5th through the 31st. The flooding during the early part of the month was caused by rains in late April. The White River at Georgetown and Des Arc, Ark. was above flood stage from the 15th to the 25th. The Little Red at Judsonia, Ark. made a sharp rise on the 14th to above flood stage on that date. Only minor damages resulted from the overflows.

**Arkansas Basin.**—Heavy rains in the upper watershed of the Walnut and Whitewater streams during the morning hours of the 27th flooded the City of El Dorado, Kans. with new record stages. Rainfall was very localized. El Dorado recorded 4.3 inches, Augusta, 18 miles to the south southwest recorded only 0.8 inch. Climax, about 35 miles east, reported less than 0.5 inch, Florence, 34 miles to the north measured 1.4 inches, McPherson, 65 miles to the northwest measured 1.1 inches. Unofficial reports of 8 inches were received in the vicinity of Potwin and Towanda. The crest of the flood at El Dorado was 14.8 feet compared to 13.5 feet in 1928 and 12.5 feet in April 1944. Two lives were lost. It is estimated that the damage in El Dorado alone will exceed \$1,000,000.

Minor flooding occurred on the Poteau River at Poteau, Okla. from 5th to the 8th and again on the 13th. The rainfall averaged 3.9 inches from the 11th to the 12th. Some flood damage resulted in the reach from below Wister Reservoir to Panama, Okla.

**Red Basin.**—The general moderate to heavy rains from the 10th to the 18th caused sharp rises over the Ouachita at and below Arkadelphia, Ark. and extensive flooding in and below Camden area on the Ouachita and tributaries including the Black River. This was due partly to the relatively high stages which prevailed from the previous month before the occurrence of the heavy rains. Several thousand acres of farm land were inundated resulting in several millions of dollars damage to buildings, cotton, corn and livestock. Operations at the Smackover Oil Field were suspended for several days causing the loss of wages to its employees.

There were two floods on the Little River in Arkansas and Sulphur River in Texas during the month. Flooding on the Cypress and Red Rivers was confined to the lower portions. The first flood on the Little and Sulphur Rivers was due to heavy rainfall on April 23, 24 and 29. Amounts between 2.5 to over 3 inches were common over the Sulphur and Little River Basins on April 23d and 24th. Clayton, Coalgate and Caney, Okla., recorded amounts over 4 inches during the same period. Shreveport, La. recorded 15.5 inches from April 28 to May 18. During this same period Grand Ecure, La. recorded 26.5 inches and Alexandria, 24.2 inches. No damage was reported on the Sulphur and Little Rivers. Heavy damage was reported in the Red Basin below Shreveport, La.

**Atchafalaya Basin.**—Flood stage was slightly exceeded on the Atchafalaya River at Morgan City, La. several times during the month. The overflows did not last more than a few hours each time.

**Lower Mississippi.**—The Tallahatchie and Yazoo Rivers remained from 2 to 3 feet above flood stage from the 4th to the end of the month, due to heavy rains on April 29-30, May 3-6 and May 11-19. The rainfall was the heaviest over the headwaters of the Coldwater and Tallahatchie Rivers. The overflows caused considerable damage to crops. However, the recently completed Arkabutla Dam con-

trolled the water on the Coldwater River and greatly minimized the flood damage over the basin.

**WEST GULF OF MEXICO DRAINAGE.**—Severe floods occurred in Louisiana on the Vermillion, Nezpique, Mermentau and Calcasieu Rivers during May. The overflows on the Nezpique and Calcasieu Rivers were record breaking, and among the most damaging of record. The flooding on the lower Sabine River at and below Milam, Tex., was near the highest of record. At Lake Charles, La. backwater from the Calcasieu reached the eastern section of the city by a short cut spillover from above and caused an estimated \$10,000,000 damage. Total flood damage is estimated at several score millions of dollars.

The rise during the 1st decade of the month was due to rains which occurred during the latter part of April and again on May 4-5. The latter rains ranged from very light over the upper Sabine to near 3.5 inches over the middle and lower Sabine. The rain averaged over 4 inches in the upper Calcasieu. The rise later in the month was due to heavy rains which began on the 11th and continued for 7 to 9 days. The rain was very heavy across the lower Sabine and Louisiana streams on the 18th and ranged from 8 to 12 inches on that day. The rainfall during the 9-day period ranged from 8.8 inches at Gladewater, Tex. to 19.8 inches at Glenmora, La.

Flooding was in progress on the Trinity River at Liberty, Tex. in the beginning of the month from the heavy rains on April 28 and 29. Rainfall during that period ranged from 2 to 9 inches. Additional heavy rain on May 4 and 5 and from May 10 to 19 caused considerable flooding in eastern Texas streams. Rainfall during the latter period was excessive and ranged from 4 to 12 inches on the Neches River, 8 to 9 inches on the Trinity (below Long Lake) and an average of 6.7 inches on the Brazos from slightly above Waco to Richmond with a center near McGregor of 10.7 inches. Considerable agricultural damage resulted in the Neches Watershed above Beaumont and in the Trinity Basin. Widespread distribution of warnings prevented extensive loss to livestock and other movable property.

Heavy rains over the San Marcos River watershed and moderate rains over the upper part of the Guadalupe Watershed caused a sharp rise in the Guadalupe River at Gonzales to a crest of 31.1 feet, 11.1 feet above flood stage, on April 30. There was very little rain over the tributaries below Gonzales so the crest flattened considerably and flood stage was not reached at Cuero, Tex. At Victoria, Tex. the rise was very slow to a crest of 23.2 feet on the 4th. The flooding on Navidad River at Ganado and Lavaca River at Edna, Tex. was due to the heavy rains on the 13-14th and on 18th. Very little damage resulted from the overflows as practically all the land flooded was grazing land.

Low water records on the Rio Grande continue to be broken especially below Laredo, Tex. where numerous no-flow conditions are being observed. Most of these conditions are due to diversion of water from the stream along points of the watershed above Laredo. It is estimated that several thousands of acres of land, both on the Mexico and United States sides have been placed under cultivation above the General Valley area during the past 4 years. A good portion of this land is dependent on the Rio Grande and wells for water. The wells are slowing the flow of the springs feeding the Rio Grande.

# FLOOD STAGE DATA

(All dates in May unless otherwise specified)

Table 5

MAY 1953

River and station	Flood stage	Above flood stages -dates		Crest*	
		From-	To-	Stage	Date
HUDSON BAY DRAINAGE					
Red River of the North: Moorhead, Minn.	17	31	June 4	23.9	June 1
ATLANTIC SLOPE DRAINAGE					
Connecticut: Hartford, Conn.	16	3	5	17.0	4
Savannah: Clio, Ga.	11	9	24	15.7	18
Ogeechee:					
Midville, Ga.	6	6	12	7.5	6
Dover, Ga.	7	9	17	10.0	10
Ocmulgee:					
Macon, Ga.	18	1	3	23.0	1
Hawkinsville, Ga.	25	7	8	25.6	7
Abbeville, Ga.	11	11	15	14.8	9
Lumber City, Ga.	15	12	16	17.0	13
Oconee:					
Milledgeville, Ga.	20	3	5	23.2	3
Mount Vernon, Ga.	16	8	16	18.8	11-12
Dublin, Ga.	21	7	11	23.2	8
Altamaha: Charlotte, Ga.	12	9	22	20.8	13-14
EAST GULF OF MEXICO DRAINAGE					
Chattahoochee:					
Eufaula, Ala.	40	3	5	48.4	3
Columbia, Ala.	42	4	5	45.6	4
Ft.:					
Montezuma, Ga.	20	4	4	20.4	4
Albany, Ga.	20	6	11	26.8	8-9
Bainbridge, Ga.	25	10	13	26.9	11-12
Apalachicola:					
Chattahoochee, Fla.	20	6	10	21.4	7-8
Blountstown, Fla.	15	3	20	21.9	8-9
Choctawhatchee:					
Newton, Ala.	19	3	5	29.7	4
Caryville, Fla.	12	7	10	12.8	8
Conecuh: River Falls, Ala.	37	8	8	37.1	8
Alabama:					
Montgomery, Ala.	35	8	10	37.2	9
Millers Ferry, Ala.	40	5	13	43.6	12
Claiborne, Ala.	40	7	15	41.8	13
Black Warrior: Tuscaloosa, Ala.	47	1	1	47.3	1
Tombigbee:					
Aberdeen, Miss.	34	2	2	35.2	2
		5	6	35.0	6
Demopolis, Ala.	39	2	18	52.0	9
Lock No. 3, Whitefield, Ala.	33	1	24	53.4	10
Lock No. 2, Pennington, Ala.	46	2	18	54.6	10-11
Lock No. 1, Jackson, Ala.	31	3	23	36.4	10-14
Leaf: Hattiesburg, Miss.	22	5	8	24.0	6
Chickasawhay:					
Enterprise, Miss.	20	1	4	23.0	2
Shubuta, Miss.	30	4	8	31.8	6
Pascagoula: Merrill, Miss.	22	7	22	23.4	10
Bogue Chitto: Franklinton, La.	11	5	7	14.5	8
		20	22	12.1	21
Pearl:					
Edinburg, Miss.	20	2	10	23.5	4
Goshen Springs, Miss.	18	3	13	23.5	8
Jackson, Miss.	18	Apr. 30	29	31.6	9
Monticello, Miss.	15	Apr. 30	28	23.6	5
				25.1	20
Columbia, Miss.	17	3	29	23.3	6
				24.0	22
Bogalusa, La.	15	Apr. 26	**	20.0	9
				20.1	24-25
Pearl River, La.	12	Apr. 29	**	16.2	10
				16.2	14
MISSISSIPPI SYSTEM					
Missouri Basin					
North Branch of Elkhorn: Pierce (nr.), Nebr.	12	10	12	13.2	10
Prairie Dog Creek: Norton, Kans.	17	28	29	25.6	28
Grand:					
Sumner, Mo.	26	Apr. 30	2	27.8	1
		5	9	30.1	7
Brunswick, Mo.	12	6	10	14.5	8
Ohio Basin					
Allegheny:					
Lock 5, Freeport, Pa.	21	31	June 1	22.5	31
Lock 4, Natrona, Pa.	20	31	31	20.2	31

River and station	Flood stage	Above flood stages -dates		Crest*	
		From--	To--	Stage	Date
<b>MISSISSIPPI SYSTEM (Cont'd.)</b>					
<b>Ohio Basin (Cont'd.)</b>					
Allegheny: (Cont'd.)					
Lock 3, Acmetonia, Pa.	20	31	31	20.3	31
Levisa Fork: Pikeville, Ky.	36	20	20	38.1	20
Paint Creek: Bourneville, Ohio	10	22	22	15.2	22
Scioto: LaRue, Ohio	11	23	24	12.8	23
Rough: Dundee (nr.), Ky.	25	17	23	27.8	20
Green:					
Munfordville, Ky.	28	20	22	31.2	22
Lock No. 6, Brownsville, Ky.	28	19	23	32.7	21
Lock No. 4, Woodbury, Ky.	33	18	25	40.5	22
Rumsey, Ky.	34	19	30	39.3	26
West Fork:					
Muncie, Ind.	6	23	23	6.0	23
Anderson, Ind.	10	18	18	10.4	18
		23	24	11.4	24
Spencer, Ind.	14	27	27	14.0	27
West Fork: Edwardsport, Ind.	12	18	22	12.8	20
		25	29	14.5	28-29
Wabash:					
Lafayette, Ind.	11	26	26	11.0	26
Montezuma, Ind.	14	26	26	14.2	26
Tennessee:					
Gilbertsville, Ky.	320	19	21	321.3	20
Florence, Ala.	419	4	4	419.3	4
		5	6	419.1	5
<b>White Basin</b>					
Little Red: Judsonia, Ark.	30	14	14	30.8	14
White:					
Georgetown, Ark.	21	15	25	22.0	20
Des Arc, Ark.	24	15	25	24.9	20
Clarendon, Ark.		4	**	29.0	20
St. Charles, Ark.	25	5	**	27.4	21
<b>Arkansas Basin</b>					
Walnut:					
El Dorado, Kans.	8.5	27	27	14.8	27
Augusta, Kans.	23	27	27	32.2	27
Poteau: Poteau, Okla.	24	5	8	24.6 <sup>a</sup>	6
		13	13	26.6 <sup>a</sup>	13
<b>Red Basin</b>					
Little Missouri: Boughton, Ark.	20	1	1	20.1	1
		12	13	21.3	12
Ouachita:					
Arkadelphia, Ark.	17	12	20	23.6	13
Camden, Ark.	26	1	9	33.0	4
		13	30	38.7	17
Monroe, La.	40	17	**	45.9	31 & June 1
Black: Jonesville, La.	50	17	**	54.8	27-28
Little: Whitecliffs, Ark.	25	Apr. 27	6	27.9	2
		13	21	29.0	14
Sulphur:					
Naples, Tex.	22	Apr. 27	11	30.7	8
		14	26	28.2	19
McCartney Bridge, Tex.	20	Apr. 27	**	30.5	7
				29.1	22
Cypress: Jefferson, Tex.	18	17	26	24.2	20
Red:					
Grand Ecore, La.	33	4	9	34.1	6
		15	31	40.5	23
Alexandria, La.	32	2	**	42.1	24
Coldwater: Sarah, Miss.	18	5	**	21.1	5
				21.0	11
				22.2	17
				22.5	19
Tallahatchie: Swan Lake, Miss.	26	3	31	28.3	9
				29.7	21
Yazoo: Yazoo City, Miss.	29	4	31	32.0	30
<b>Atchafalaya Basin</b>					
Atchafalaya: Morgan City, La.	6.0	4	4	6.2	4
		15	15	6.1	15
		18	18	6.0	18
		29	29	6.1	29
		30	30	6.3	30
		31	31	6.3	31
<b>WEST GULF OF MEXICO DRAINAGE</b>					
Vermillion: Lafayette, La.	14	14	14	14.4 <sup>a</sup>	14
Nesque Bayou: Basile, La.	22	6	10	24.5	8
		17	27	34.4	21
Mermentau: Mermentau, La.	5	16	June 1	13.6	23



# FLOOD STAGE DATA

(All dates in May unless otherwise specified)

Table 5-Continued

MAY 1953

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
WEST GULF OF MEXICO DRAINAGE (Cont'd.)	<i>ft</i>			<i>ft</i>	
Calcasieu:					
Oakdale, La.	13	1 18	5 22	20.5 22.6	2 19
Old Town Bay, La.	4	3	29	10.0 16.1	7 21
Lake Charles, La.	6	21	26	9.8	22
Sabine:					
Mineola, Tex.	14	Apr. 28 13	7 24	19.9 18.6	2 17
Gladewater, Tex.	26	4	29	36.7	20
Logansport, La.	25	3	**	35.9	19
Milam, Tex.	35	Apr. 30	31	40.4 47.0	7 20
Bon Wier, Tex.	17	Apr. 30	31	23.3 25.7	1 19
Orange, Tex.	4	21	31	6.0	24
Angelina: Horger, Tex.	30	17	28	36.2 <sup>#</sup>	20
Neches:					
Rockland, Tex.	22	17	28	27.6 <sup>#</sup>	20
Evadale, Tex.	16	2	**	22.5 <sup>#</sup>	25
Beaumont, Tex.	7	24	28	7.8 <sup>#</sup>	26
East Fork: Rockwell, Tex.	10	Apr. 29 14	1 20	18.4 13.4	30 18

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
WEST GULF OF MEXICO DRAINAGE (Cont'd.)	<i>ft</i>			<i>ft</i>	
Trinity: Dallas, Tex.	28	Apr. 29 16	1 18	32.4 35.7	30 17
Rosser, Tex.	26	1 16	5 21	31.3 30.5	3 19
Trinidad, Tex.	28	3 15	8 25	33.8 35.3	7 22
Long Lake, Tex.	40	16	27	44.2 <sup>#</sup>	20
Midway, Tex.	40	22	30	43.0 <sup>#</sup>	26
Liberty, Tex.	24	Apr. 30 12	10 **	27.5 <sup>#</sup> 28.0 <sup>#</sup>	3 22
Little: Cameron, Tex.	30	15	18	31.4 <sup>#</sup>	16
Brazos: East Columbia, Tex.	30	18	22	31.8 <sup>#</sup>	20
Guadalupe:					
Gonzales, Tex.	20	Apr. 30	1	31.1	Apr. 30
Victoria, Tex.	21	3	4	23.2	4
Lavaca: Edna, Tex.	21	20	20	22.1	20
Navidad: Canada, Tex.	21	17	21	21.9 26.2	17 20

\* Provisional

\*\* Continued at end of month

<sup>#</sup> High stages due to releases at Wister Reservoir

<sup>#</sup> Over the gage

<sup>#</sup> Highest stage reported but not necessarily the crest

# RADIOSONDE DATA

Average monthly values

MAY 1953

Table 20

ALBUQUERQUE, N. MEX. (834 MB.)				ATLANTA, GA. (980 MB.)				BIG SPRING, TEX. (920 MB.)				BISMARCK, N. DAK. (951 MB.)				BOISE, IDAHO (913 MB.)				BROWNSVILLE, TEX. (1009 MB.)				BUFFALO, N. Y. (988 MB.)				
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,629	16.9	28	31	309	21.4	77	31	784	23.2	34	31	505	11.6	70	31	868	12.7	56	31	7	25.3	84	31	221	11.9	83
1,000	31	36			31	136			31	49			31	83			31	92			31	88	24.8	83	31	116		
950	31	492			31	587	22.4	64	31	507			31	517	11.0	61	31	532			31	543	22.7	75	31	553	13.1	71
900	31	963			31	1,053	19.2	64	31	979	23.7	32	31	967	9.7	62	31	987	12.8	48	31	1,009	21.7	60	31	1,003	11.6	67
850	31	1,457			31	1,542	15.7	64	31	1,475	20.1	33	31	1,439	6.6	64	31	1,464	9.3	47	31	1,504	20.1	45	31	1,479	9.3	66
800	31	1,973	14.8	26	31	2,054	12.6	57	31	1,994	16.2	35	31	1,934	3.5	65	31	1,963	5.3	51	31	2,024	18.1	36	31	1,979	6.6	63
750	31	2,517	10.1	28	31	2,597	10.1	44	31	2,541	11.9	37	31	2,463	1.1	62	31	2,488	1.0	57	31	2,582	15.2	31	31	2,513	3.8	58
700	31	3,082	5.1	33	31	3,164	6.7	39	31	3,111	7.4	37	31	3,008	-1.9	57	31	3,037	-3.4	61	31	3,184	11.4		31	3,169	-2.8	57
650	31	3,681	-2.4	40	31	3,772	3.0	40	31	3,720	3.0	33	31	3,599	-5.2	52	31	3,625	-7.7	59	31	3,775	7.3		31	3,755	-6.7	56
600	31	4,316	-5.6	46	31	4,412	-8.8	38	31	4,359	-2.1	32	31	4,218	-8.8	44	31	4,236	-11.9	53	31	4,421	2.5		31	4,386	-6.7	51
550	31	4,988	-11.3	50	31	5,107	-5.5		31	5,050	-7.2	31	31	4,892	-13.2	46	31	4,901	-16.6	48	31	5,119	-2.7		31	5,063	-10.9	48
500	31	5,715	-16.8	51	31	5,847	-10.3		31	5,783	-12.3	25	31	5,607	-18.4	49	31	5,605	-21.9	48	31	5,866	-8.2		31	5,817	-15.4	45
450	31	6,504	-22.1	42	31	6,659	-15.9		31	6,589	-17.5		31	6,390	-23.8	46	31	6,375	-27.7	46	31	6,684	-14.2		31	6,648	-20.8	46
400	31	7,354	-28.2	35	31	7,527	-22.3		31	7,453	-24.0		31	7,235	-30.1	45	31	7,208	-34.1	48	31	7,558	-20.9		31	7,535	-26.9	44
350	31	8,298	-35.1		31	8,495	-29.3		31	8,410	-31.4		31	8,168	-37.6		31	8,130	-40.6		31	8,526	-28.2		31	8,504	-33.9	41
300	31	9,357	-42.6		31	9,578	-37.3		31	9,485	-39.6		31	9,214	-45.5		31	9,163	-47.4		31	9,612	-36.7		31	9,585	-41.8	
250	31	10,566	-50.0		31	10,812	-47.1		31	10,706	-48.4		31	10,408	-52.8		31	10,353	-52.4		31	10,846	-46.4		31	10,817	-50.2	
200	31	12,007	-55.2		31	12,260	-57.3		31	12,149	-55.7		31	11,837	-59.4		31	11,787	-59.9		31	12,293	-56.5		31	12,262	-58.7	
175	31	12,854	-57.1		31	13,095	-61.5		31	12,992	-58.8		31	12,696	-53.8		31	12,651	-52.9		31	13,129	-61.3		31	13,103	-58.5	
150	31	13,826	-58.5		31	14,043	-64.3		31	13,953	-61.4		31	13,656	-53.3		31	13,644	-53.0		31	14,073	-66.4		31	14,048	-60.7	
125	31	14,967	-60.5		31	15,155	-65.7		31	15,070	-64.0		31	14,818	-53.8		31	14,818	-53.8		31	15,162	-71.0		31	15,137	-65.5	
100	31	16,346	-63.3		31	16,499	-67.1		31	16,432	-66.8		31	16,279	-56.2		31	16,247	-54.7		31	16,473	-75.1		31	16,448	-69.6	
80	31	17,718	-62.3		31	17,884	-65.9		31	17,770	-65.0		31	17,684	-56.5		31	17,671	-55.7		31	17,774	-72.6		31	17,748	-67.2	
60	31	19,512	-58.3		31	19,615	-61.5		31	19,551	-60.2		31	19,515	-55.5		31	19,510	-54.9		31	19,500	-63.9		31	19,475	-57.2	
50	31	20,670	-56.1		31	20,758	-58.3		31	20,696	-57.1		31	20,617	-54.4		31	20,678	-54.0		31	20,627	-59.9		31	20,602	-55.5	
40	31	22,100	-53.8		31	22,181	-54.6		31	22,122	-54.8		31	22,101	-53.1		31	22,146	-53.2		31	22,036	-55.8		31	22,011	-53.5	
30	31	23,938	-51.1		31	24,061	-51.5		31				31	23,991	-51.3		31	23,985	-51.6		31	23,897	-51.9		31	23,872	-51.5	

BURRWOOD, LA. (1014 MB.)				CARIBOU, ME. (990 MB.)				CHARLESTON, S. C. (1015 MB.)				COLUMBIA, MO. (984 MB.)				DODGE CITY, KANS. (920 MB.)				EL PASO, TEX. (877 MB.)				ELY, NEV. (805 MB.)				
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	3	24.3	89	31	191	9.7	69	31	13	22.0	84	31	238	17.4	70	31	792	16.9	59	31	1,195	22.4	19	31	1,906	7.9	41
1,000	31	125	24.2	84	31	104			31	139	23.8	73	31	95			31	69			31	35			31	76		
950	31	581	22.3	81	31	535	9.8	58	31	592	22.8	59	31	536	17.1	64	31	515			31	497			31	521		
900	31	1,043	20.0	57	31	1,043	20.0	57	31	1,043	19.7	59	31	1,038	14.6	65	31	1,038	16.5	52	31	1,069			31	1,061		
850	31	1,534	17.8	43	31	1,449	5.9	58	31	1,547	16.1	60	31	1,476	12.2	62	31	1,463	13.9	52	31	1,466	21.4	18	31	1,455		
800	31	2,050	14.8	38	31	1,941	1.8	64	31	2,060	12.8	52	31	1,982	9.7	57	31	1,972	11.1	53	31	1,986	16.9	20	31	1,962	8.6	36
750	31	2,602	12.0	33	31	2,465	-1.7	66	31	2,605	9.9	39	31	2,524	6.7	51	31	2,509	7.9	53	31	2,532	12.2	22	31	2,494	5.0	38
700	31	3,167	8.9	27	31	3,005	-4.9	58	31	3,169	6.9	31	31	3,079	3.2	44	31	3,074	3.7	52	31	3,103	7.3	25	31	3,050	1.1	43
650	31	3,781	5.2	26	31	3,590	-7.9	50	31	3,780	3.1	27	31	3,684	-6.3	36	31	3,675	-1.5	50	31	3,708	2.1	31	31	3,642	-5.1	51
600	31	4,425	-1.0	26	31	4,202	-11.2	42	31	4,416	-1.4	29	31	4,313	-4.9	34	31	4,308	-5.0	49	31	4,347	-2.8	31	31	4,261	-10.1	54
550	31	5,121	-3.8		31	4,871	-15.3	39	31	5,108	-5.9		31	4,993	-9.3		31	4,984	-9.7	48	31	5,031	-7.6		31	4,928	-15.2	54
500	31	5,863	-9.1		31	5,578	-19.7	42	31	5,843	-11.1	42	31	5,722	-14.3		31	5,714	-15.3	48	31	5,764	-12.8		31	5,659	-20.2	50
450	31	6,683	-14.7		31	6,363	-24.8	42	31	6,654	-16.4		31	6,520	-20.0		31	6,508	-21.2	44	31	6,563	-18.5		31	6,420	-25.3	45
400	31	7,551	-21.2		31	7,200	-30.9	42	31	7,519	-22.8		31	7,376	-26.4		31	7,362	-27.7		31	7,427	-24.7		31	7,257	-31.3	42
350	31	8,521	-28.6		31	8,134	-37.4		31	8,484	-30.1		31	8,327	-33.1		31	8,311	-34.6		31	8,382	-32.0		31	8,189	-38.0	
300	31	9,605	-37.2		31	9,181	-44.6		31	9,561	-38.7		31	9,392	-40.6		31	9,369	-42.4		31	9,456	-40.0		31			



# RADIOSONDE DATA

Average monthly values

Table 20—Continued

MAY 1953

Standard pressure surface (mb.)	INTERNAT. FALLS, MINN. ( 969 MB.)				LAKE CHARLES, LA. (1012 MB.)				LANDER, WYO. ( 826 MB.)				LAS VEGAS, NEV. ( 933 MB.)				LITTLE ROCK, ARK. (1003 MB.)				MAZATLAN, MEXICO (1008 MB.)				MEDFORD, ORE. ( 969 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	360	8.8	67	31	5	23.8	88	31	1,696	8.5	56	31	660	21.6	13	31	79	20.8	76	28	14	24.5	74	31	401	13.0	65
1,000	31	99			31	111	23.8	88	31	76			31	48			31	102	21.0	74	28	84	23.8	74	31	135		
950	31	530	11.2	56	31	561	21.5	78	31	518			31	501			31	550	20.4	66	28	535	23.2	45	31	570	12.1	61
900	31	978	6.7	56	31	1,028	19.1	72	31	975			31	968	19.7		31	1,012	17.9	67	28	1,003	22.5	35	31	1,018	8.8	63
850	31	1,448	5.5	59	31	1,518	16.9	61	31	1,452			31	1,456	15.4		31	1,499	15.3	62	28	1,498	19.9		31	1,488	5.0	69
800	30	1,945	2.3	61	31	2,034	14.8	48	31	1,956	7.7	52	31	1,964	10.9	21	31	2,012	13.4	50	28	2,018	17.4		31	1,979	1.3	74
750	30	2,468	-5.5	59	31	2,583	12.0	45	31	2,488	3.7	55	31	2,499	6.1	27	31	2,557	10.3	44	28	2,575	14.3		31	2,496	-2.2	75
700	30	3,012	-3.5	56	31	3,152	8.7	40	31	3,041	-3.3	59	31	3,058	1.2	33	31	3,122	6.6	42	28	3,144	10.8		31	3,041	-5.3	70
650	30	3,603	-6.5	53	31	3,764	4.9	35	31	3,634	-4.7	61	31	3,652	-3.8	37	31	3,728	2.7	41	28	3,762	6.8		31	3,624	-9.2	61
600	29	4,218	-10.0	49	31	4,409			31	4,254	-9.3	61	31	4,275	-8.3	36	31	4,369	-1.4	39	28	4,409	2.2		31	4,232	-13.0	56
550	29	4,891	-14.2	46	31	5,105	-3.8		31	4,924	-13.9	58	31	4,947	-12.4	31	31	5,059	-5.9	39	27	5,103	-2.6		31	4,893	-17.3	52
500	29	5,600	-18.9	42	30	5,850	-9.1		31	5,638	-19.0	51	31	5,667	-17.3		31	5,796	-10.6		27	5,852	-7.8		31	5,598	-22.1	48
450	29	6,381	-24.4	40	30	6,665	-15.1		31	6,421	-24.6	50	31	6,453	-22.4		31	6,609	-16.4		27	6,666	-13.7		30	6,366	-28.1	46
400	29	7,223	-30.8	37	29	7,538	-21.7		31	7,259	-31.0	47	31	7,303	-28.5		31	7,473	-23.0		27	7,547	-20.0		30	7,197	-34.5	42
350	29	8,156	-37.9		29	8,506	-29.1		31	8,192	-38.1		31	8,244	-35.8		31	8,435	-30.4		26	8,521	-27.4		30	8,117	-41.1	
300	29	9,199	-45.4		28	9,584	-37.5		30	9,230	-45.9		31	9,296	-43.4		30	9,515	-38.5		24	9,613	-35.2		30	9,148	-47.9	
250	29	10,393	-52.5		27	10,816	-47.1		27	10,424	-51.7		31	10,500	-50.3		30	10,742	-47.6		21	10,858	-44.3		30	10,338	-52.1	
200	29	11,821	-55.7		27	12,258	-56.8		25	11,861	-53.3		31	11,935	-56.0		30	12,184	-56.4		20	12,337	-54.0		30	11,773	-54.0	
175	28	12,664	-54.2		27	13,093	-61.5		24	12,712	-52.6		29	12,788	-57.3		30	13,023	-60.0		20	13,178	-57.9		28	12,930	-53.9	
150	27	13,653	-53.2		27	14,038	-65.2		23	13,706	-52.4		29	13,756	-57.9		29	13,978	-63.4		20	14,123	-60.0		28	13,896	-54.9	
125	27	14,823	-54.5		26	15,144	-67.5		22	14,871	-53.4		28	14,901	-58.0		29	15,100	-63.4		20	15,247	-60.0		27	14,968	-54.9	
100	26	16,248	-55.8		24	16,484	-69.5		18	16,288	-56.0		25	16,299	-59.3		27	16,464	-65.3		20	16,611	-60.6		26	16,216	-54.3	
80	25	17,668	-55.8		18	17,806	-68.9		14	17,687	-56.6		22	17,685	-59.2		27	17,820	-65.4		17	17,960	-60.6		26	17,445	-54.9	
60	18	19,512	-55.0		16	19,553	-62.9		10	19,506	-56.1		18	19,495	-57.4		23	19,600	-60.6		17	19,743	-54.8		26	19,463	-54.8	
50	18	20,677	-54.6		15	20,682	-60.1		7	20,687	-53.7		15	20,653	-55.8		16	20,751	-57.1		16	20,895	-54.3		17	20,645	-54.1	
40	14	22,110	-53.7		14	22,060	-56.6						10	22,092	-54.3		9	22,189	-54.4						11	22,087	-52.8	
30	8	23,942	-52.8		5	23,938	-52.4						5	23,947	-51.5													

MERIDA, MEXICO (1008 MB.)				MIAMI, FLA. (1016 MB.)				NANTUCKET, MASS. (1012 MB.)				NASHVILLE, TENN. ( 993 MB.)				NORTH PLATTE, NEBR. ( 913 MB.)				OAKLAND, CALIF. (1016 MB.)				OKLAHOMA CITY, OKLA. ( 965 MB.)				
Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	
SURFACE	30	27	29.0	68	31	4	25.7	76	31	14	10.1	94	31	177	21.2	78	31	848	13.0	64	31	6	14.7	66	31	391	19.6	67
1,000	30	98	28.5	69	31	141	24.8	73	31	115	12.2	84	31	117			31	67			31	141	13.3	65	31	80		
950	30	554	25.7	71	31	590	22.0	71	31	551	13.0	70	31	565	20.3	66	31	511			31	571	10.9	61	31	528	19.9	63
900	30	1,028	23.2	70	31	1,057	19.2	63	31	1,001	11.5	62	31	1,028	17.4	65	31	966	13.1	58	31	1,020	6.9	56	31	991	17.2	62
850	30	1,526	20.2	70	31	1,547	16.5	54	31	1,477	9.0	59	31	1,514	14.4	62	31	1,444	10.5	58	31	1,491	6.4	51	31	1,478	13.4	67
800	30	2,047	17.3	64	31	2,061	13.9	44	31	1,976	6.0	59	31	2,023	11.4	53	31	1,946	7.1	62	31	1,986	3.6	46	31	1,970	13.1	47
750	30	2,597	14.2	54	31	2,601	11.3	38	31	2,508	3.0	60	31	2,563	8.8	40	31	2,478	4.0	63	31	2,510	-4	46	31	2,532	9.6	43
700	30	3,175	10.8	42	31	3,175	8.3	32	31	3,058	1	54	31	3,127	5.2	39	31	3,033	1.0	58	31	3,057	-3.0	39	31	3,097	5.6	44
650	29	3,791	7.4	37	31	3,786	4.8		31	3,652	-3.1	49	31	3,732	1.5	38	31	3,632	-2.8	53	31	3,643	-6.4	37	31	3,705	1.4	40
600	29	4,442	3.3	31	31	4,431			31	4,278	-6.8	52	31	4,366	-2.5	31	31	4,255	-7.1	51	31	4,262	-10.4	35	31	4,338	-3.1	36
550	29	5,142	-7		31	5,123	-3.2		31	4,955	-10.6	50	31	5,053	-7.1		30	4,932	-11.7	44	31	4,928	-14.6	33	31	5,024	-8.0	34
500	28	5,989	-5.3		31	5,873	-8.0		31	5,680	-15.0	46	31	5,788	-12.1		30	5,650	-17.4	43	31	5,642	-19.3		31	5,733	-13.2	
450	28	6,722	-10.7		31	6,688	-13.8		31	6,476	-20.1	41	31	6,594	-17.6		29	6,437	-25.0	38	31	6,422	-24.6		31	6,556	-18.6	
400	28	7,613	-16.9		31	7,567	-20.4		31	7,384	-26.2	39	31	7,457	-23.8	35	28	7,281	-29.4	42	31	7,264	-30.5		31	7,415	-25.0	
350	27	8,601	-24.0		30	8,540	-27.7		31	8,284	-33.3		31	8,418	-31.2		26	8,207	-36.8		30	8,197	-37.1		31	8,371	-32.0	
300	25	9,707	-32.0		30	9,628	-35.9		31	9,347	-41.0		31	9,491	-39.5		26	9,254	-45.2		30	9,246	-43.8		30	9,432	-40.7	
250	25	10,969	-41.5		30	10,869	-45.2		31	10																		

# RADIOSONDE DATA

Average monthly values

Table 20—Continued

MAY 1953

SAN JUAN, P. R. (1014 MB.)				SANTA MARIA, CALIF. (1009 MB.)				S. STE. MARIE, MICH. ( 986 MB.)				SPOKANE, WASH. ( 929 MB.)				SWAN ISLAND, W. I. (1010 MB.)				TACUBAYA, MEXICO ( 772 MB.)				TAMPA, FLA.								
Standard pressure surface (mb.)																																
Number of observations				Dynamic height				Temperature				Relative humidity				Number of observations				Dynamic height				Temperature				Relative humidity				
SURFACE				31	19	25.3	83	31	71	13.1	70	30	221	8.1	74	31	722	13.5	54	31	10	26.9	82	31	2,306	20.8	40	31	9	24.3	77	
1,000				31	143	24.7	78	31	139	12.8	68	30	117			31	98			31	99	26.2	82	31	7			31	142	24.9	72	
950				31	599	21.7	81	31	575	11.3	61	30	547	10.4	53	31	540			31	552	22.7	83	31	467			31	593	22.6	67	
900				31	1,061	18.9	80	31	1,019	9.9	52	30	992	8.5	52	31	992	11.7	51	31	1,021	20.1	79	31	951			31	1,061	19.5	68	
850				31	1,550	16.0	75	31	1,492	7.8	45	30	1,462	6.0	54	31	1,466	7.9	52	31	1,513	17.7	72	31	1,453			31	1,551	16.2	67	
800				31	2,064	13.5	66	31	1,989	5.1	36	30	1,957	3.4	53	31	1,963	3.9	56	31	2,030	15.0	64	31	1,993			31	2,065	13.8	53	
750				31	2,611	10.8	59	31	2,519	2.1	27	30	2,479		54	31	2,488		61	31	2,580	12.3	57	31	2,554	19.3	38	31	2,611	11.1	38	
700				31	3,178	7.9	53	31	3,066		1.0	26	3,029		53	31	3,031		64	31	3,150	9.1	50	31	3,139	14.7	42	31	3,179	8.0	30	
650				31	3,796	4.4	49	31	3,660		4.4	27	3,619		49	31	3,619		58	30	3,763	5.6	46	31	3,765	9.5	50	31	3,791	4.5	22	
600				31	4,434		52	31	4,280		7.5	27	4,240		55	31	4,227		52	30	4,411		41	31	4,420	4.1	59	31	4,433		3	
550				31	5,134		53	31	4,954		11.7	28	4,912		40	31	4,889		46	30	5,111		1.3	31	5,126		1.5	67	31	5,124		4.1
500				31	5,876		52	31	5,676		16.4		5,631		40	31	5,594		43	30	5,864		5.3	31	5,874		6.5	64	31	5,869		9.1
450				31	6,703		49	31	6,468		21.7		6,418		37	31	6,365		41	30	6,689		10.4	31	6,701		11.2	45	31	6,688		14.6
400				31	7,578		44	31	7,318		27.6		7,267		37	31	7,195		42	29	7,582		16.6	31	7,588		16.4		31	7,557		21.3
350				31	8,560		44	31	8,264		34.5		8,206		35.6		8,114		41.3	28	8,571		23.4	31	8,578		23.3		31	8,527		28.6
300				31	9,659		43	31	9,323		42.6		9,264		42.9		9,143		48.4	28	9,678		31.6	31	9,687		31.6		31	9,611		36.7
250				31	10,912		43.1	31	10,530		51.2		10,471		51.0		10,325		53.3	28	10,940		41.5	28	10,952		41.2		31	10,847		46.3
200				31	12,377		54.8	31	11,954		58.3		11,901		56.4		11,753		54.3	26	12,414		53.4	26	12,431		52.7		31	12,294		56.4
175				31	13,218		61.1	31	12,790		60.2		12,749		55.5		12,610		53.4	27	13,259		60.0	25	13,282		58.8		31	13,131		61.4
150				31	14,159		67.2	31	13,750		60.1		13,732		55.5		13,601		52.7	26	14,203		66.8	21	14,236		65.5		31	14,075		66.1
125				30	15,241		72.4	31	14,886		60.5		14,891		55.8		14,777		53.1	24	15,285		73.7	19	15,331		72.0		31	15,170		69.3
100				27	16,548		75.0	30	16,271		60.6		16,297		57.3		16,212		53.9	21	16,572		78.6	17	16,626		77.0		28	16,492		72.2
80				23	17,845		72.8	30	17,558		60.5		17,708		57.2		17,644		54.8	11	17,835		77.8	12	17,910		78.2		27	17,803		70.8
60				18	19,556		66.3	27	19,457		57.7		19,517		56.4		19,484		55.0	10	19,525		68.8	8	19,585		70.7		24	19,531		64.2
50				15	20,664		62.2	21	20,611		55.8		20,679		55.3		20,643		54.5	5	20,628		64.4	5	20,689		64.2		22	20,657		59.8
40				13	22,053		58.0	14	22,032		54.1		22,086		54.1		22,095		53.5	9	22,003		59.7	5	22,074		58.3		21	22,064		55.7
30				8	23,880		53.5	8	23,881		51.4					15	23,938		53.4	7	23,823		55.2				11	23,903		52.8		

TATOOSH ISLAND, WASH. (1012 MB.)				VERACRUZ, MEXICO (1005 MB.)				WASHINGTON, D. C. (1004 MB.)							
Number of observations				Dynamic height				Temperature				Relative humidity			
SURFACE				31	31	10.5	82	27	13	27.5	82	31	88	18.1	79
1,000				31	131	10.5	78	27	62	27.2	81	31	122	18.1	76
950				31	560	8.2	74	27	518	26.7	67	31	566	18.9	64
900				31	1,002	6.0	72	27	994	24.7	62	31	1,027	16.6	63
850				31	1,468	3.2	68	27	1,494	21.7	60	31	1,511	13.5	64
800				31	1,957		63	27	2,019	18.9	52	31	2,019	10.3	64
750				31	2,479		62	27	2,575	15.9	40	31	2,559		63
700				31	3,017		61	27	3,153	12.2	37	31	3,118		61
650				31	3,600		58	27	3,773	7.9	39	31	3,720		58
600				31	4,207		53	27	4,425	3.4	41	31	4,353		57
550				31	4,870		54	25	5,119		1.2	31	5,037		50
500				31	5,569		50	23	5,877		6.3	31	5,771		49
450				31	6,341		48	20	6,702		10.8	31	6,577		46
400				31	7,164		49	20	7,591		16.6	31	7,443		44
350				30	8,089		41.8	18	8,579		23.6	31	8,404		41
300				29	9,116		48.9	16	9,691		31.6	31	9,479		38.9
250				29	10,296		54.2	16	10,956		41.0	31	10,705		47.6
200				25	11,694		53.1	16	12,437		52.5	29	12,146		56.6
175				24	12,561		52.5	16	13,287		58.9	29	12,985		59.7
150				24	13,558		51.9	15	14,235		65.7	29	13,943		61.3
125				23	14,733		52.6	11	15,334		71.8	28	15,073		61.3
100				21	16,177		53.0	8	16,631		77.8	26	16,446		62.4
80				19	17,610		53.5	5	17,897		77.6	25	17,824		62.0
60				15	19,474		53.9	5	19,581		67.6	22	19,616		59.8
50				8	20,627		54.1	5	20,696		60.9	21	20,756		57.8
40				6	22,056		53.6					20	22,173		55.1
30												19	24,023		51.9
20												12	26,684		48.3
15												9	28,631		42.5

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and

expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.



## Average monthly resultant winds

MAY 1953

Table 21

• 18,000 m.	27 obs.	284 dir.	8.0 speed
20,000 m.	26 obs.	339 dir.	1.1 speed
22,000 m.	25 obs.	316 dir.	2.8 speed
24,000 m.	25 obs.	2 dir.	.4 speed
26,000 m.	21 obs.	353 dir.	1.6 speed
28,000 m.	15 obs.	62 dir.	1.7 speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

# RAWIN DATA

Average monthly resultant winds

Table 22

MAY 1953

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrowood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			Int. Falls, Minn. (358 m.)				
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations				
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed			
Surface	31	257	0.8	31	151	3.7	31	161	0.8	30	127	5.3	31	150	3.2	30	341	0.7	31	197	2.1	31	120	0.9	31	183	0.8	31	227	1.4	30	192	2.4	29	76	1.0		
500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
1,000	---	---	---	31	179	5.5	31	201	1.2	29	136	8.5	31	154	4.0	30	285	7.7	31	231	6.0	31	178	2.7	---	---	---	31	238	4.6	28	252	6.1	29	102	1.9		
1,500	---	---	---	31	194	6.6	31	236	1.9	29	154	6.6	30	185	3.8	29	294	3.8	30	266	4.8	30	239	6.2	30	190	9.9	31	253	7.8	28	269	6.0	29	177	1.3		
2,000	31	255	4.6	31	209	6.4	31	251	2.9	29	157	5.6	30	175	3.9	27	295	5.4	29	276	4.5	30	240	7.5	30	218	2.8	30	269	7.0	26	301	7.6	26	272	3.4		
2,500	31	260	5.9	31	235	7.2	31	253	3.7	29	172	5.3	30	185	3.7	26	288	5.9	29	278	4.9	30	243	8.9	30	219	3.0	30	276	8.0	26	306	8.5	26	282	4.9		
3,000	31	255	7.4	31	241	8.9	31	267	4.1	29	192	5.1	30	208	4.1	26	286	6.8	29	283	5.3	30	247	10.7	30	222	4.2	30	285	8.5	26	314	9.6	26	282	6.1		
4,000	30	251	9.3	31	244	12.3	30	269	4.8	30	239	6.0	31	220	4.9	23	287	8.9	26	280	8.4	28	248	13.2	29	229	5.3	29	283	12.4	25	302	12.2	26	281	9.0		
5,000	29	246	11.0	29	249	14.0	29	252	5.9	30	243	7.3	31	237	5.1	23	280	9.8	24	277	9.5	28	258	15.8	27	224	7.5	29	280	14.5	23	301	12.6	26	280	11.1		
6,000	28	247	12.0	27	251	14.7	28	262	5.5	29	252	7.3	30	253	7.3	22	278	12.5	20	267	8.7	24	262	15.4	24	239	9.3	29	277	15.7	22	297	15.0	26	277	13.5		
8,000	16	273	10.2	25	251	17.5	25	280	9.1	27	261	10.6	26	275	9.5	22	276	18.3	19	270	12.1	22	260	18.6	18	232	3.1	25	288	15.9	19	301	15.2	20	269	18.2		
10,000	13	271	13.5	20	246	22.4	21	255	6.4	26	262	16.3	28	272	12.5	21	281	24.6	16	258	14.9	19	253	22.3	17	287	6.3	21	279	17.4	16	309	17.8	13	263	20.6		
12,000	---	---	---	10	249	18.4	15	241	4.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
16,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
18,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
20,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
22,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P.R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)			
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		
Surface	31	150	1.1	31	324	1.9	31	102	3.9	31	173	0.4	31	227	1.3	31	269	4.7	30	123	2.8	31	321	2.5	31	109	3.4	31	110	2.8	31	122	0.7	31	270	3.6	
500	31	191	3.7	30	314	2.3	31	105	6.9	31	293	1.9	29	223	4.4	31	284	5.6	26	116	2.3	---	---	---	---	---	---	---	31	120	5.7	31	101	6.1	30	121	8.1
1,000	31	204	5.7	30	292	1.9	31	106	6.3	31	284	3.0	29	230	6.7	31	288	5.2	26	174	4.5	31	322	2.7	31	141	6.3	31	109	6.3	30	213	1.6	31	321	5.2	
1,500	31	217	7.1	29	275	2.1	31	106	4.7	31	290	5.0	30	230	7.3	31	294	4.5	26	209	6.0	31	293	2.9	31	166	4.7	31	108	5.8	29	249	2.2	31	338	4.5	
2,000	31	226	9.3	28	268	2.5	31	101	4.3	31	283	6.7	30	245	7.2	31	297	4.0	26	233	6.6	30	250	4.8	31	194	5.2	31	109	4.8	29	253	4.3	31	333	4.0	
2,500	31	233	10.2	28	266	2.5	31	96	4.2	31	287	7.7	30	257	7.7	31	297	4.1	27	246	8.3	30	253	6.6	31	219	6.2	31	120	4.1	27	259	3.4	31	321	5.7	
3,000	31	240	11.1	27	285	2.3	31	91	4.1	31	285	9.6	29	260	8.5	31	296	4.9	27	255	9.0	29	254	8.5	31	240	7.2	31	122	2.9	28	266	4.3	31	313	7.1	
4,000	29	246	10.8	27	303	2.9	31	84	3.4	30	285	12.7	30	260	10.2	31	292	7.9	28	264	11.8	28	254	9.6	31	245	9.8	31	117	1.7	27	269	6.2	30	299	10.1	
5,000	27	250	11.7	28	290	4.2	31	52	2.4	28	285	14.3	30	264	13.1	31	293	10.8	29	259	13.5	28	256	11.3	30	246	11.6	31	202	1.5	25	272	7.6	29	289	13.6	
6,000	24	260	12.3	28	287	4.8	31	356	1.4	26	294	15.9	27	269	13.5	30	302	14.1	28	252	14.7	24	261	7.2	29	251	13.1	31	239	3.0	25	274	9.4	28	286	16.5	
8,000	17	260	14.2	26	292	7.3	30	313	4.7	21	275	17.6	22	270	15.4	25	293	18.4	25	247	18.7	21	245	8.9	26	255	18.9	31	269	7.7	23	288	9.4	21	280	16.8	
10,000	13	254	14.2	22	276	12.3	30	290	8.0	18	268	22.0	20	272	16.7	14	284	21.9	18	253	18.5	17	223	11.6	11	263	10.3	31	279	15.1	15	287	9.5	14	289	16.3	
12,000	10	277	14.2	15	252	11.4	30	284	18.3	11	291	20.9	13	282	20.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14,000	---	---	---	11	272	7.6	27	289	17.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
16,000	---	---	---	10	259	2.0	21	304	10.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
18,000	---	---	---	10	79	7	14	317	1.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
20,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
22,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D.C. (88 m.)		
	No. of	Direction	Speed	No. of	Direction	Speed	No. of	Direction	Speed	No. of	Direction	Speed
Surface	31	205	0.9	31	210	1.5	31	222	2.9	31	155	0.5
500	30	211	1.4	---	---	---	31	223	3.6	30	226	2.1
1,000	30	211	2.0	31	225	2.6	30	206	2.9	30	261	4.9
1,500	30	235	3.0	31	237	3.4	30	201	3.6	30	276	7.5
2,000	30	270	4.1	31	230	3.3	29	200	3.4	31	278	8.7
2,500	30	278	4.1	31	251	2.6	29	189	3.7	31	278	9.8
3,000	29	281	4.9	31	264	1.8	29	190	4.4	31	281	11.6
4,000	29	273	8.3	31	225	1.8	29	194	4.9	31	287	14.0
5,000	28	271	11.2	31	205	2.7	29					



# SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun.

MAY 1953

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
TABLE MOUNTAIN, CALIF.									
	Air mass								
	3.76	3.01	2.26	1.51	*1.0	1.51	2.26	3.01	3.76
May 1-----	-----	-----	-----	1.46	-----	-----	-----	-----	-----
2-----	-----	-----	-----	1.44	-----	-----	-----	-----	-----
7-----	-----	-----	-----	1.43	-----	-----	-----	-----	-----
10-----	-----	-----	-----	1.31	-----	-----	-----	-----	-----
22-----	-----	-----	-----	1.38	-----	-----	-----	-----	-----
Average	-----	-----	-----	1.40	-----	-----	-----	-----	-----
Departures	-----	-----	-----	+ .01	-----	-----	-----	-----	-----
LINCOLN, NEBR.									
	Air mass								
	4.77	3.81	2.86	1.91	*1.0	1.91	2.86	3.81	4.77
May 8-----	-----	-----	-----	-----	-----	1.01	-----	-----	-----
14-----	-----	-----	-----	-----	-----	1.05	0.86	0.64	-----
21-----	-----	-----	-----	-----	-----	1.08	.88	.71	-----
Average	-----	-----	-----	-----	-----	1.05	.87	.67	-----
Departures	-----	-----	-----	-----	-----	-.06	-.03	-.12	-----
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*1.0	1.94	2.92	3.89	4.86
May 1-25-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
31-----	0.83	0.93	1.06	Record lost 1.20	-----	-----	-----	-----	-----
Average	.83	.93	1.06	1.20	-----	-----	-----	-----	-----
Departures	+ .10	+ .10	+ .12	+ .13	-----	-----	-----	-----	-----
* Extrapolated									

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
ALBUQUERQUE, N. MEX.									
	Air mass								
	4.08	3.26	2.44	1.63	*1.0	1.63	2.44	3.26	4.08
May									
1	0.94	1.04	1.17	1.29	---	---	---	---	0.96
2	---	---	1.13	1.25	---	1.25	1.12	---	---
3	---	---	---	1.36	---	---	---	---	---
4	---	---	---	---	---	1.26	---	---	---
6	.94	1.05	1.17	1.32	---	---	---	1.07	---
7	.78	.90	---	1.15	---	1.06	---	---	---
8	.90	.99	1.15	1.22	---	1.12	.98	---	---
9	.90	1.02	1.16	1.31	---	---	---	---	---
10	.87	1.00	1.14	1.32	---	1.29	1.08	.97	.86
11	.91	1.01	1.14	1.31	---	---	---	---	---
13	---	---	---	1.14	---	.95	---	---	---
16	.65	.78	.94	1.11	---	---	---	---	---
17	.65	.83	1.00	---	---	---	---	---	---
19	.73	.87	1.01	1.22	---	---	---	---	---
21	.94	1.04	1.16	1.34	---	.99	.83	.89	.53
22	1.01	---	1.22	1.38	---	---	---	---	---
23	---	---	---	1.39	---	---	---	---	---
24	.94	1.04	1.15	1.33	---	1.27	1.12	1.00	.92
25	.98	1.07	1.19	1.33	---	1.34	---	---	---
26	.97	1.06	1.18	1.34	---	---	---	---	---
27	---	---	---	1.01	---	---	---	---	---
28	---	---	---	---	---	.80	.57	---	---
29	.92	1.01	1.12	1.27	---	1.32	1.20	1.09	1.03
30	1.00	1.07	1.17	1.30	---	1.18	.98	.80	.79
31	.96	1.06	1.21	1.34	---	---	---	---	---
Averages	.87	.99	1.13	1.27	---	1.15	.99	.97	.85
Departures	+.05	+.06	+.05	+.02	---	-.07	-.11	-.01	-.05
MADISON, WIS.									
	Air mass								
	4.81	3.84	2.88	1.92	*1.0	1.92	2.88	3.84	4.81
NO DATA DURING MAY 1953									
BOSTON, MASS.									
	Air mass								
	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0
NO DATA DURING MAY 1953									

pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

# SOLAR RADIATION DATA

MAY 1953

**Table 31a** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

	7	8	9	10	11	12	13	Avg	14	15	16	17	18	19	20	Avg	21	22	23	24	25	26	27	Avg
Date-----	58	103	120	128	137	142	135	118	91	47	154	38	122	170	175	115	123	134	130	168	205	128	127	145
Langleys-----	151	172	167	152	177	165	173	165																

**Table 31b** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

	7	8	9	10	11	12	13	Avg	14	15	16	17	18	19	20	Avg	21	22	23	24	25	26	27	Avg
Date-----	71	97	134	359	352	325	151	213	73	47	372	41	112	353	233	176	298	153	230	548	423	409	249	330
Langleys-----	343	438	308	425	423	362	451	393																

**Table 31c** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

	7	8	9	10	11	12	13	Avg	14	15	16	17	18	19	20	Avg	21	22	23	24	25	26	27	Avg
Date-----	57	133	245	280	272	256	142	198	92	40	226	34	176	210	188	138	271	120	184	247	229	186	197	205
Langleys-----	235	186	143	201	226	223	240	208																

**Table 31d** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

	7	8	9	10	11	12	13	Avg	14	15	16	17	18	19	20	Avg	21	22	23	24	25	26	27	Avg
Date-----	61	193	320	366	352	299	240	261	141	47	257	42	194	282	257	174	302	200	514	471	314	130	169	300
Langleys-----	268	248	152	264	334	388	440	299																

**Table 31e** Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

	7	8	9	10	11	12	13	Avg	14	15	16	17	18	19	20	Avg	21	22	23	24	25	26	27	Avg
Date-----	113	220	173	117	141	205	220	170	148	64	220	53	183	293	303	181	297	220	135	24	250	158	220	197
Langleys-----	210	188	248	191	96	95	91	158																

Note: Langley is the unit used to denote one gram calorie per square centimeter.



## SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langley's.

	Aklavik NWT, Canada	Albuquerque, N. Mex.	Atlanta, Ga.	Astoria, Ore.	Barrow, Alaska	Bethel, Alaska	Big Springs, Texas	Bismark, N. Dak.	Boise, Idaho	Brownsville, Texas	Canton Island	Caribou, Me.	Charleston, S. C.	Cleveland, Ohio	Columbia, Mo.	Columbus, Ohio (U. of Ohio)	Davis, Calif.	Dodge City, Kans.	East Lansing, Mich.	East Wareham, Mass.	Edmonton, Alberta	El Paso, Texas	Ely, Nevada	Fort Worth, Texas	Fresno, Calif.	Glasgow, Mont.	Grand Junction, Colo.	Greensboro, N. C.	Griffin, Ga.	Hattiesburg, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.	Lander, Wyoming			
May 7-----	441	763	538	496	573	495	657	742	152	316	692	683	703	379	247	556	138	536	741	121	90	583	762	758	(820)	757	791	547	518	589	72	319	815	114	754	780		
May 8-----	308	798	572	540	421	440	649	471	323	655	754	718	586	631	278	724	398	534	784	546	286	113	785	762	758	(820)	757	791	547	518	589	72	319	815	114	754	780	
May 9-----	451	749	574	546	474	440	588	471	552	582	400	729	694	693	727	619	681	680	707	550	545	654	762	758	(820)	757	791	547	518	589	72	319	815	114	754	780		
May 10-----	528	801	731	567	538	511	612	456	709	614	558	701	677	711	691	661	681	716	707	534	605	455	810	765	758	(820)	757	791	547	518	589	72	319	815	114	754	780	
May 11-----	406	698	---	720	---	565	536	244	703	614	420	431	695	712	458	667	464	741	704	448	609	603	775	767	758	(820)	757	791	547	518	589	72	319	815	114	754	780	
May 12-----	499	575	---	710	428	855	555	484	659	740	449	633	391	649	621	375	385	703	176	109	574	---	690	681	758	(820)	757	791	547	518	589	72	319	815	114	754	780	
May 13-----	368	802	680	333	434	394	150	736	368	130	268	618	141	668	197	164	111	604	482	409	287	---	(593)	573	758	(820)	757	791	547	518	589	72	319	815	114	754	780	
Averages-----	429	728	653	562	478	500	535	480	495	522	506	645	556	635	408	508	409	649	630	393	416	469	(724)	614	(421)	(782)	522	633	620	650	635	390	803	490	593	527	780	
Departures-----	---	---	---	---	---	---	---	---	+30	---	---	---	---	---	---	---	-3	---	---	+36	-40	---	---	---	+121	---	---	---	---	---	---	---	---	+30	---	---	---	
May 14-----	617	726	617	406	526	476	502	526	231	575	146	342	79	621	208	757	205	370	780	183	209	---	727	632	237	524	746	799	567	612	623	77	731	304	296	762	780	
May 15-----	380	530	---	---	---	---	467	800	117	593	203	381	67	664	595	680	330	579	345	542	231	425	683	704	632	237	524	746	799	567	612	623	77	731	304	296	762	780
May 16-----	573	681	333	268	---	528	463	270	589	628	439	682	321	687	151	143	129	485	233	265	433	704	487	704	632	237	524	746	799	567	612	623	77	731	304	296	762	780
May 17-----	523	510	335	404	---	302	684	---	93	627	---	583	479	653	131	538	168	669	347	78	109	776	791	711	(676)	711	731	784	549	476	433	724	346	801	244	185	630	780
May 18-----	344	608	422	116	---	470	579	655	406	645	356	(508)	84	672	407	765	658	511	690	526	420	729	791	917	627	731	784	549	476	433	724	346	801	244	185	630	780	
May 19-----	397	796	---	415	---	416	594	728	539	361	553	496	286	450	627	765	454	651	632	532	193	778	218	800	(697)	437	448	292	255	676	540	347	512	761	452	454	780	780
May 20-----	323	790	647	311	---	287	490	72	451	602	650	529	705	370	712	583	669	691	764	606	350	619	770	821	743	831	212	638	629	436	568	696	727	651	741	839	780	
Averages-----	451	663	473	300	---	418	540	510	350	576	391	(503)	289	588	404	571	379	538	544	405	351	548	752	(557)	515	(628)	618	530	486	444	668	382	675	329	349	616	780	
Departures-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	-83	---	+53	-76	---	---	---	---	-25	---	---	---	---	---	---	---	---	-97	---	---	---	
May 21-----	328	801	558	590	---	249	659	400	677	414	715	645	725	623	336	735	261	681	807	410	625	592	795	761	724	809	702	787	456	458	733	364	820	649	376	330	780	
May 22-----	233	756	675	594	---	205	640	306	677	682	717	682	717	218	708	97	531	269	618	137	196	488	773	606	771	828	590	765	456	458	733	364	820	649	376	330	780	
May 23-----	425	819	635	237	---	281	606	752	534	304	752	552	291	740	815	347	289	582	299	525	518	602	674	467	752	554	851	227	524	505	715	627	759	475	496	792	780	
May 24-----	811	635	635	345	---	511	568	123	824	373	726	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
May 25-----	620	801	635	345	---	511	568	123	824	373	726	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
May 26-----	620	801	635	345	---	511	568	123	824	373	726	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
May 27-----	670	659	756	433	---	392	565	489	798	735	330	723	743	723	731	419	376	751	(768)	470	437	579	(545)	845	823	826	732	350	659	724	788	522	837	328	724	780		
Averages-----	529	780	677	481	---	371	604	528	559	529	735	478	538	706	520	600	501	618	(703)	425	505	543	(727)	707	738	745	615	583	594	639	658	483	824	442	647	603	780	
Departures-----	---	---	---	---	---	---	---	---	+103	---	---	---	---	---	---	---	---	-33	---	+68	+45	---	---	---	---	+68	---	---	---	---	---	---	---	-33	---	---	---	
May 28-----	546	640	749	616	---	329	594	102	661	471	773	527	623	610	833	583	787	655	757	618	554	727	757	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
May 29-----	687	850	721	249	---	207	683	196	612	284	811	378	561	740	631	752	740	338	720	461	658	471	658	794	---	---	---	---	---	---	---	---	---	---	---	---	---	
May 30-----	749	728	789	696	---	213	583	588	399	615	717	595	370	697	588	718	737	687	828	442	332	248	599	697	821	812	386	930	665	697	685	677	818	38	770	842	780	
May 31-----	768	690	790	---	---	368	646	797	626	546	662	263	---	(742)	487	376	784	572	719	463	649	287	770	797	801	818	812	848	680	739	683	738	722	577	726	812	780	
June 1-----	737	545	769	502	---	639	667	779	756	489	737	695	666	652	732	792	595	594	708	610	618	273	681	369	809	255	780	838	722	677	(617)	578	565	777	724	568	780	
June 2-----	709	833	714	379	---	670	677	675	749	369	786	474	351	760	819	686	795	594	786	592	679	216	770	585	809	701	857	756	755	755	828	707	849	718	711	625	780	
June 3-----	695	836	778	377	---	735	630	653	801	784	720	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Averages-----	696	743	744	516	---	494	640	541	658	744	488	533	(714)	691	656	735	612	728	528	598	386	729	534	807	643	556	741	713	710	(746)	693	741	535	727	636	780		
Departures-----	---	---	---	---	---	---	---	---	+139	---	---	---	---	---	---	---	-5	---	+113	---	---	---	---	---	---	-38	---	---	---	---	---	---	---	+39	---	---	---	

Accumulated Departures May 7 to June 3, 1953

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleya. — Continued

MAY 1953

[illegible]

Accumulated Departures May 7 to June 3, 1953

[illegible]

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.



## ILLUMINATION DATA

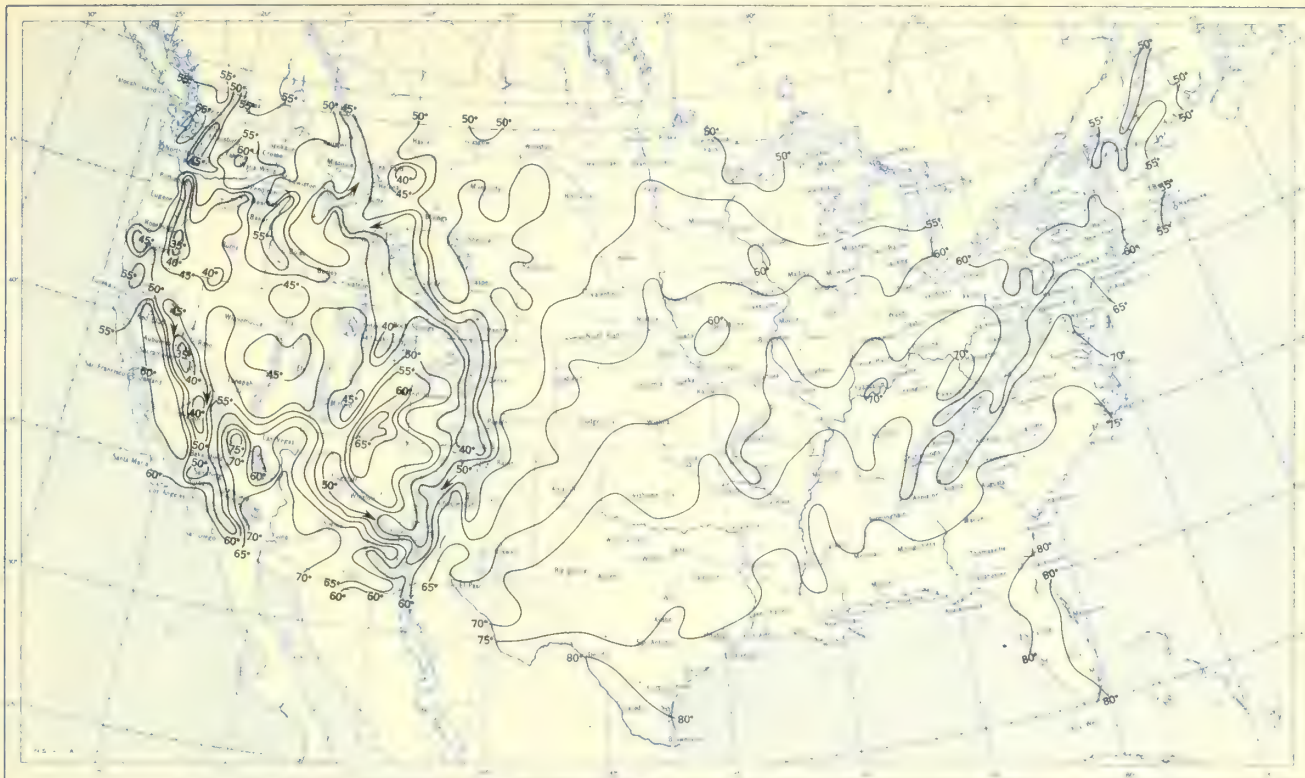
Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

MAY 1953

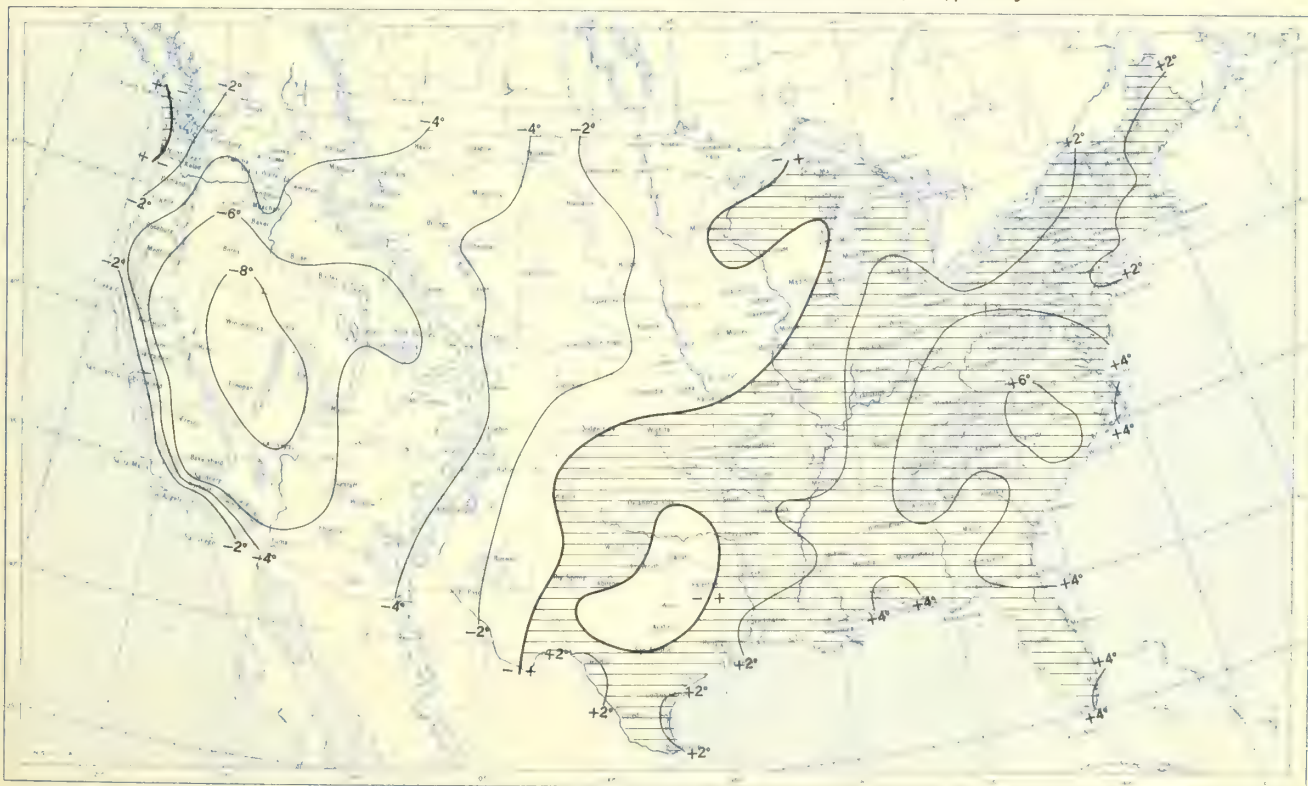
Station	Day of month																																Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Baltimore, Md.-----	557	313	668	486	311	318	---	536	547	803	714	---	779	494	458	332	499	570	203	773	---	422	840	782	426	---	562	733	760	302	87	529	
Philadelphia, Pa.-----	275	79	448	501	178	189	197	552	280	635	597	526	588	239	231	271	452	(570)	206	507	384	297	654	576	323	53	---	710	610	69	121	377	
Pittsburgh, Pa.-----	564	603	681	459	219	339	190	252	---	---	---	---	---	---	---	---	---	(661)	324	576	---	201	---	---	---	---	---	---	---	---	---	479	---
Washington, D. C. (WBCO)	652	517	662	662	---	---	---	---	612	826	728	716	738	432	428	476	528	635	---	---	644	378	796	630	364	641	766	832	879	536	---	628	

NWRC, Asheville, N. C. — 9/18/53 — 2200

Chart I. A. Average Temperature ( $^{\circ}\text{F.}$ ) at Surface, May 1953.



B. Departure of Average Temperature from Normal ( $^{\circ}\text{F.}$ ), May 1953.

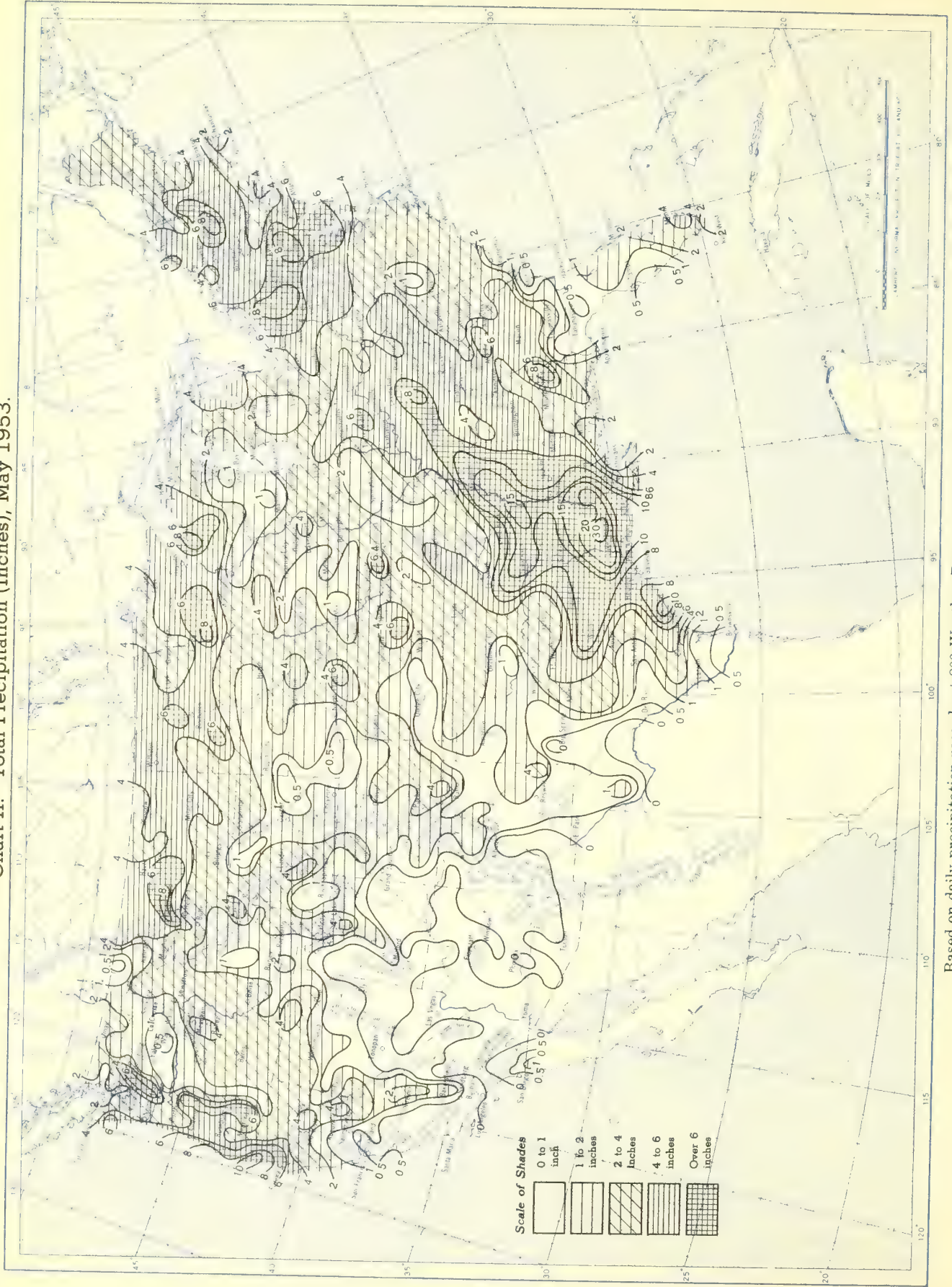


A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

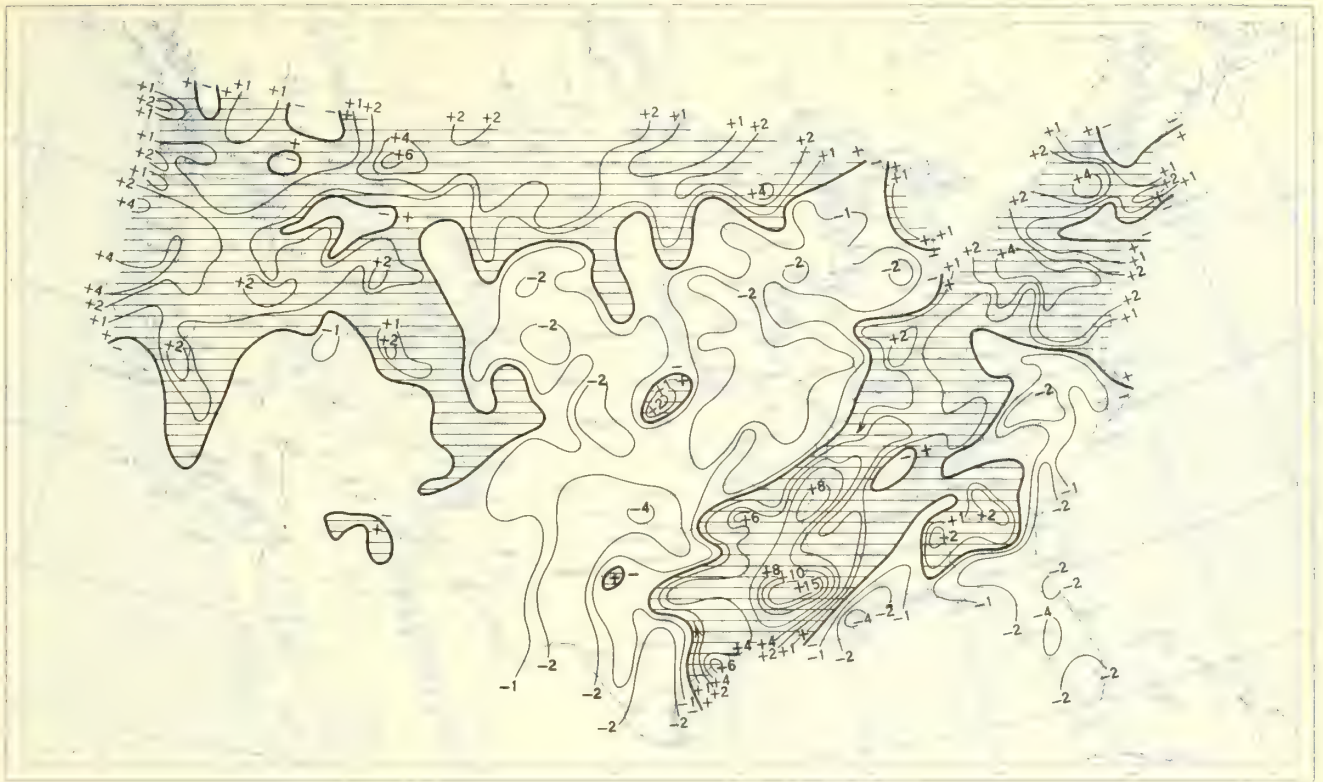


Chart II. Total Precipitation (Inches), May 1953.



Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), May 1953.



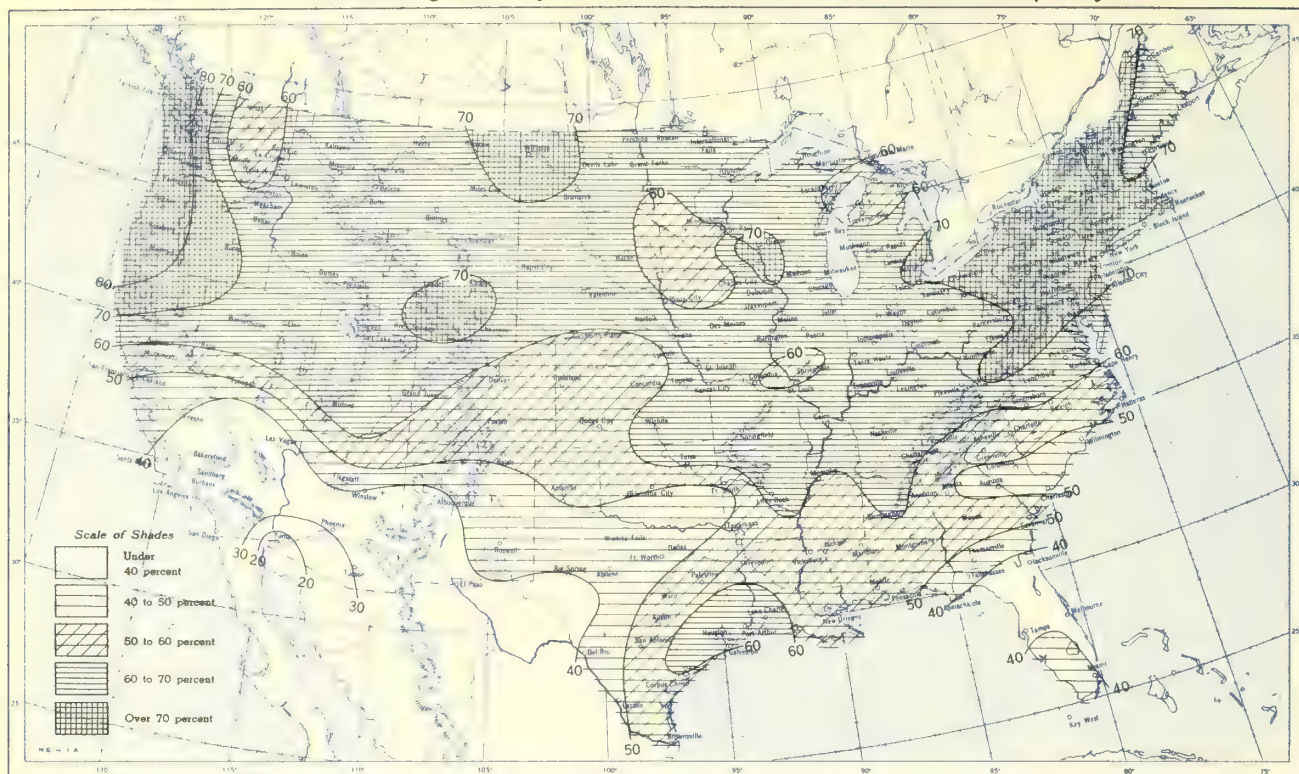
B. Percentage of Normal Precipitation, May 1953.



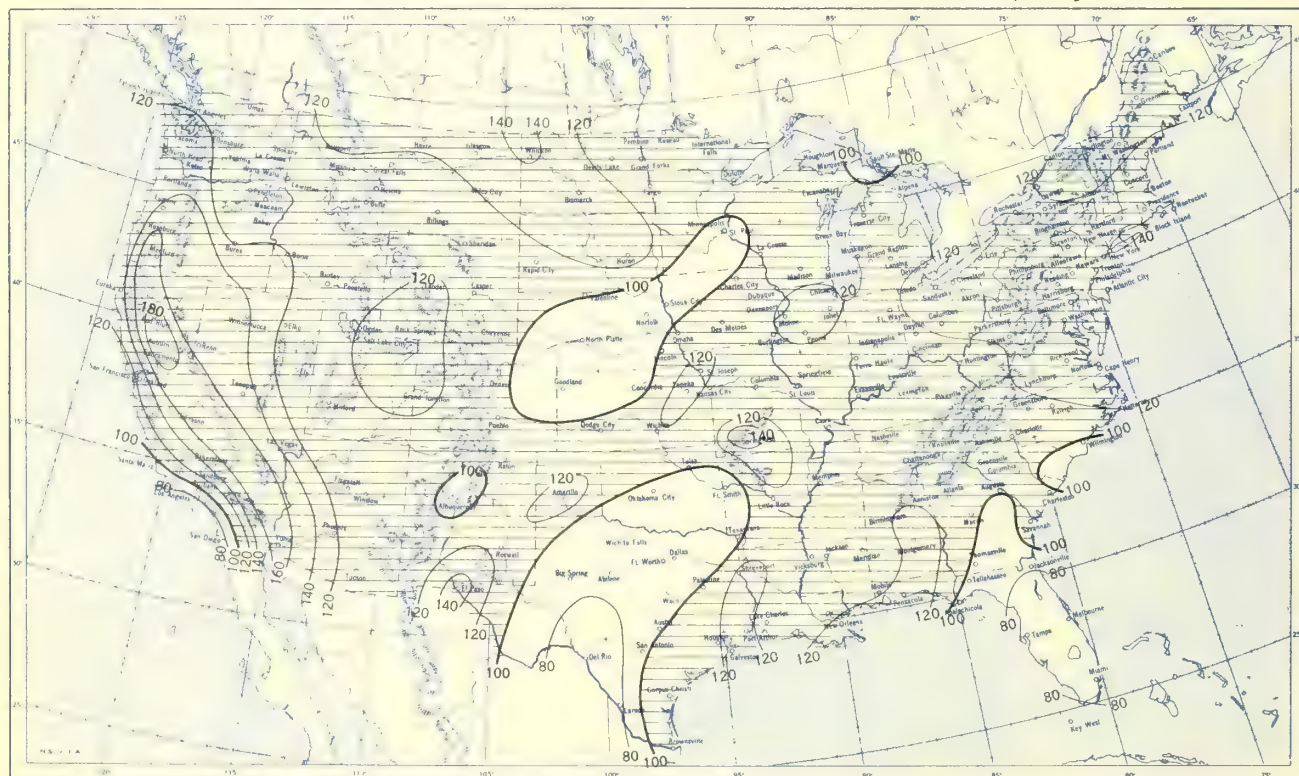
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.



Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, May 1953.



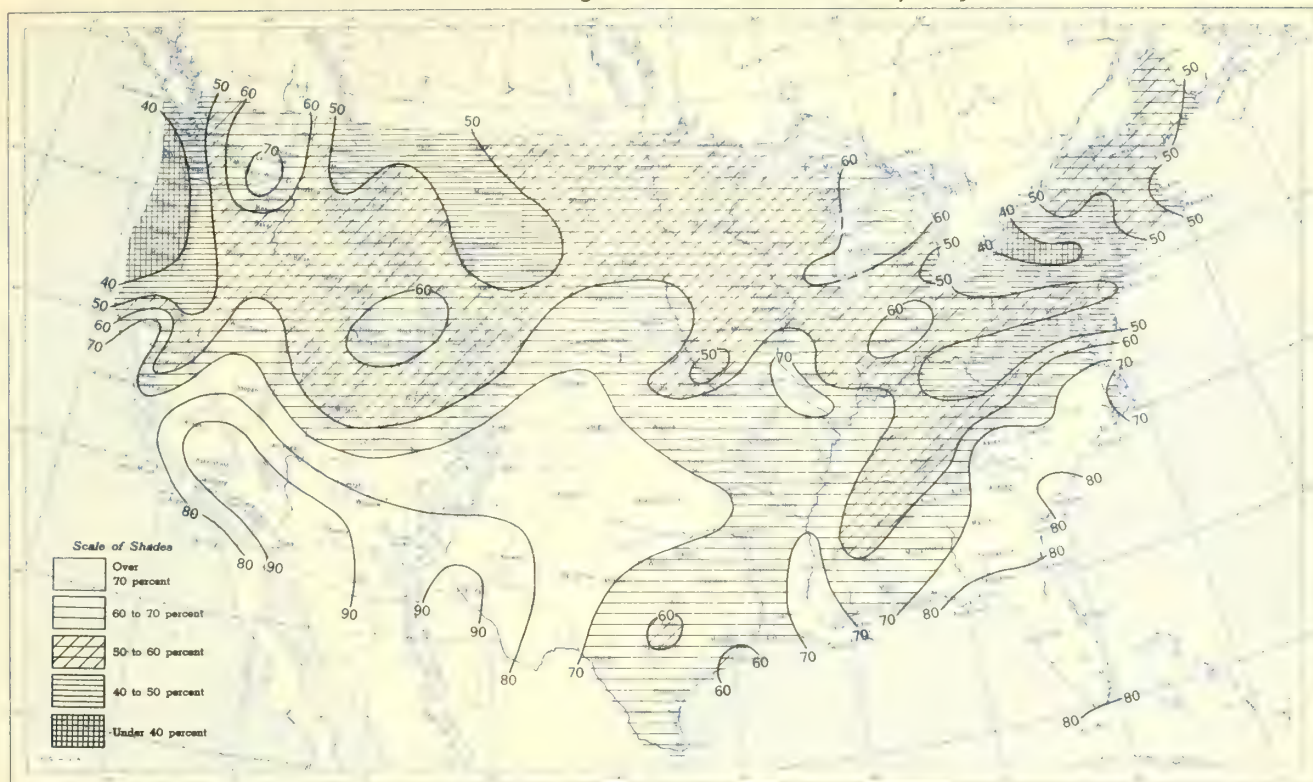
B. Percentage of Normal Sky Cover Between Sunrise and Sunset, May 1953.



A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.



Chart VII. A. Percentage of Possible Sunshine, May 1953.



B. Percentage of Normal Sunshine, May 1953.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.



Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, May 1953. Inset: Percentage of Normal Average Daily Solar Radiation, May 1953.

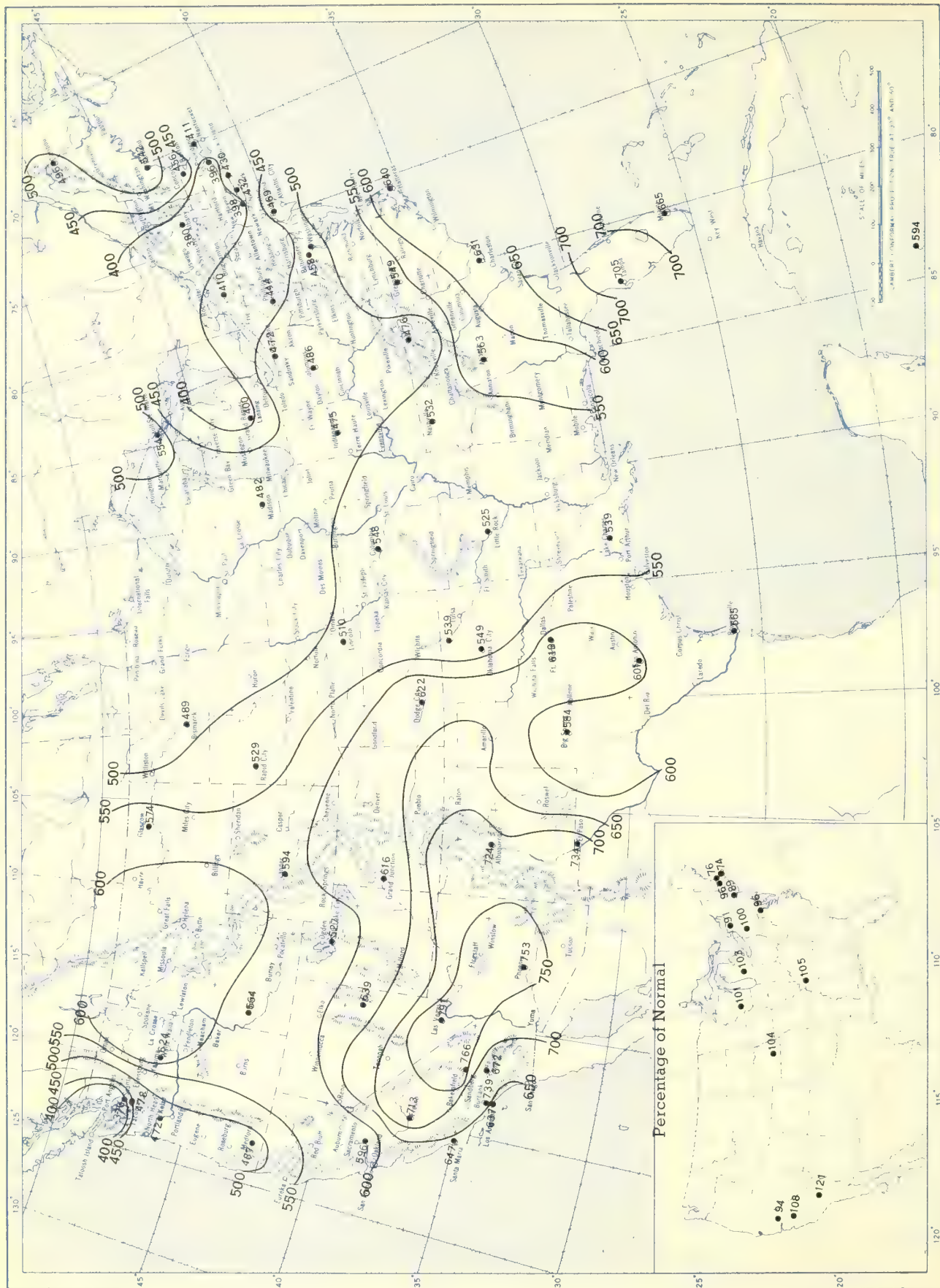


Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langley's (1 langley = 1 gm. cal. cm.⁻²). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, May 1953.

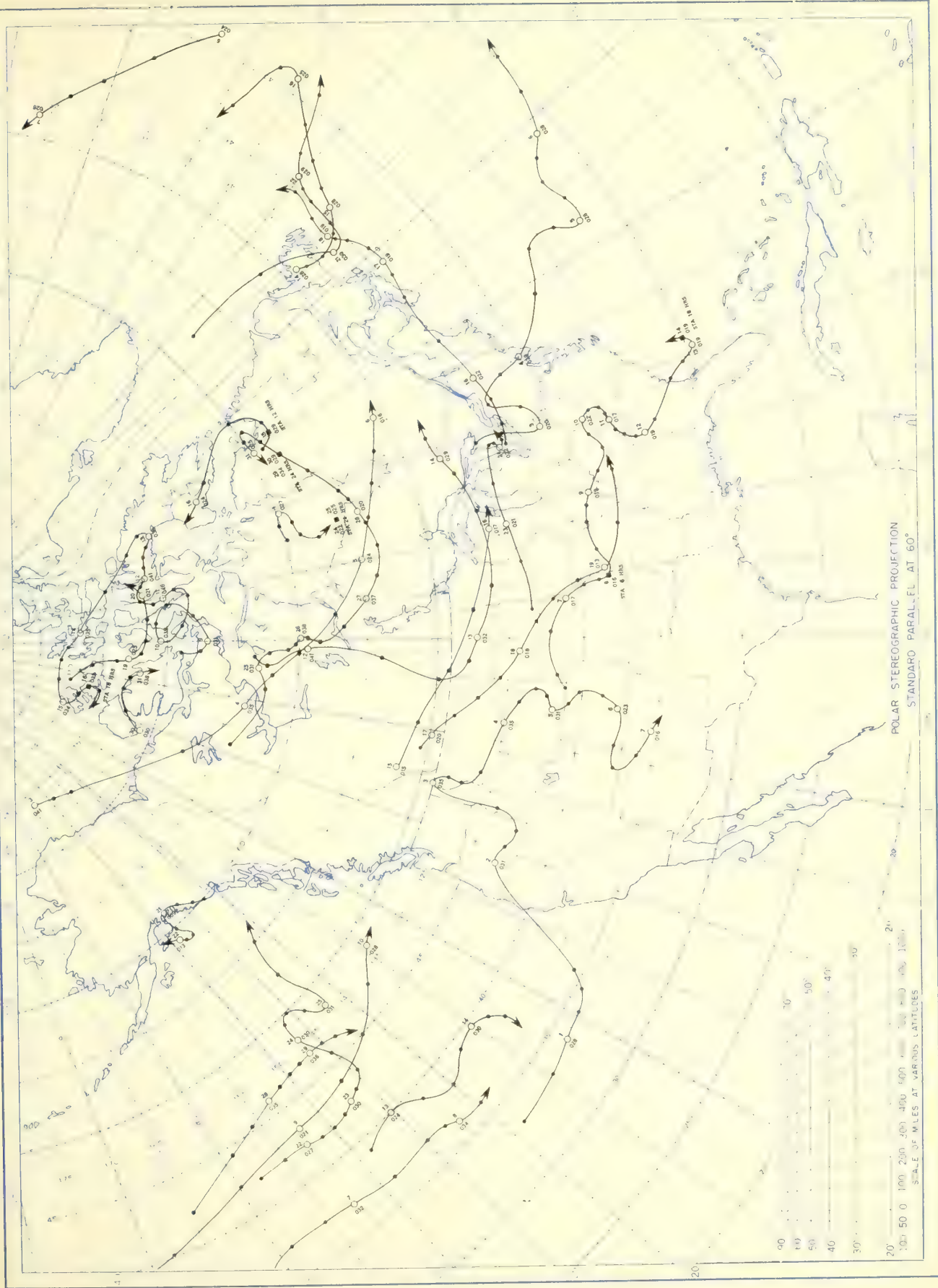
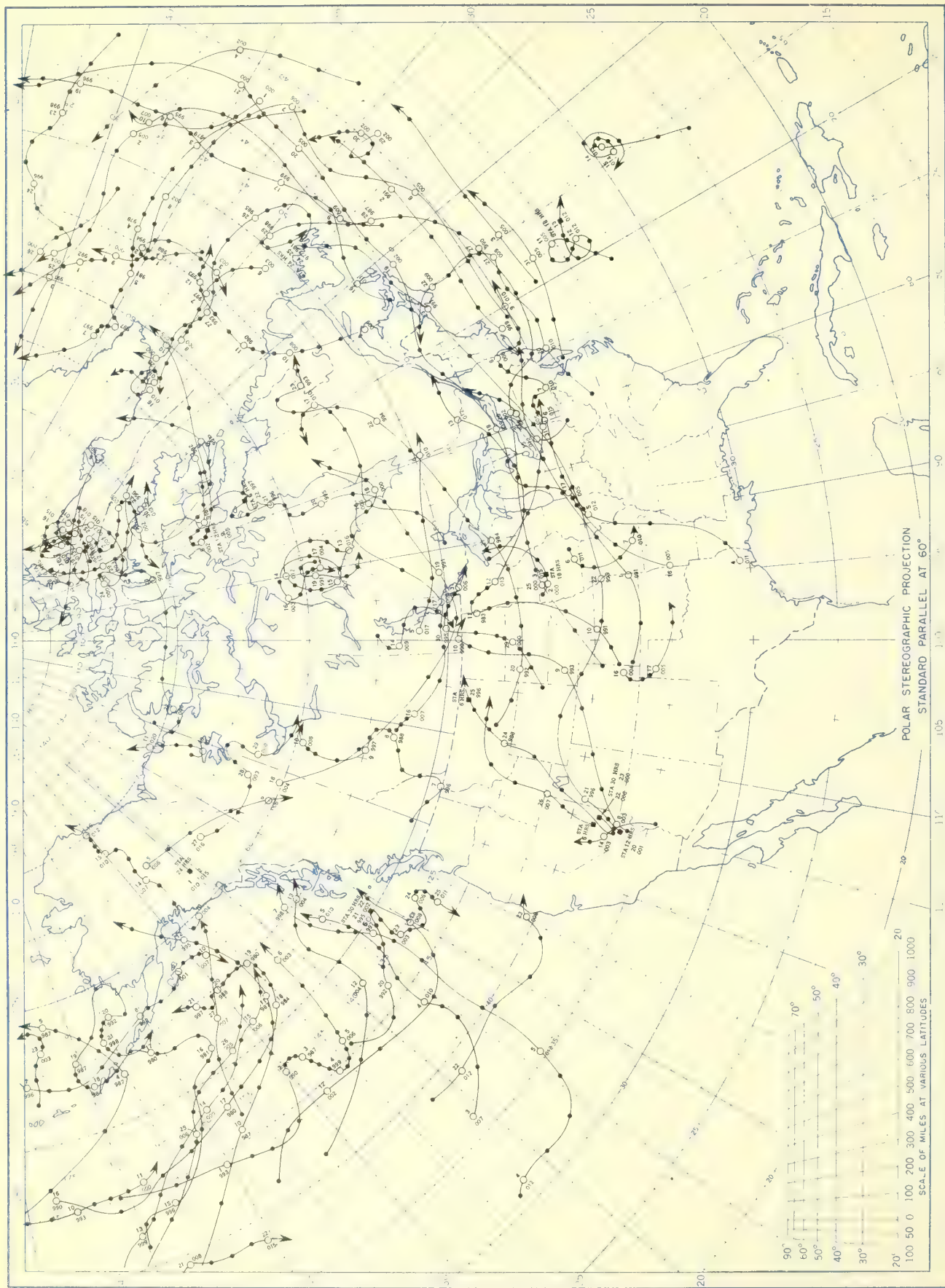


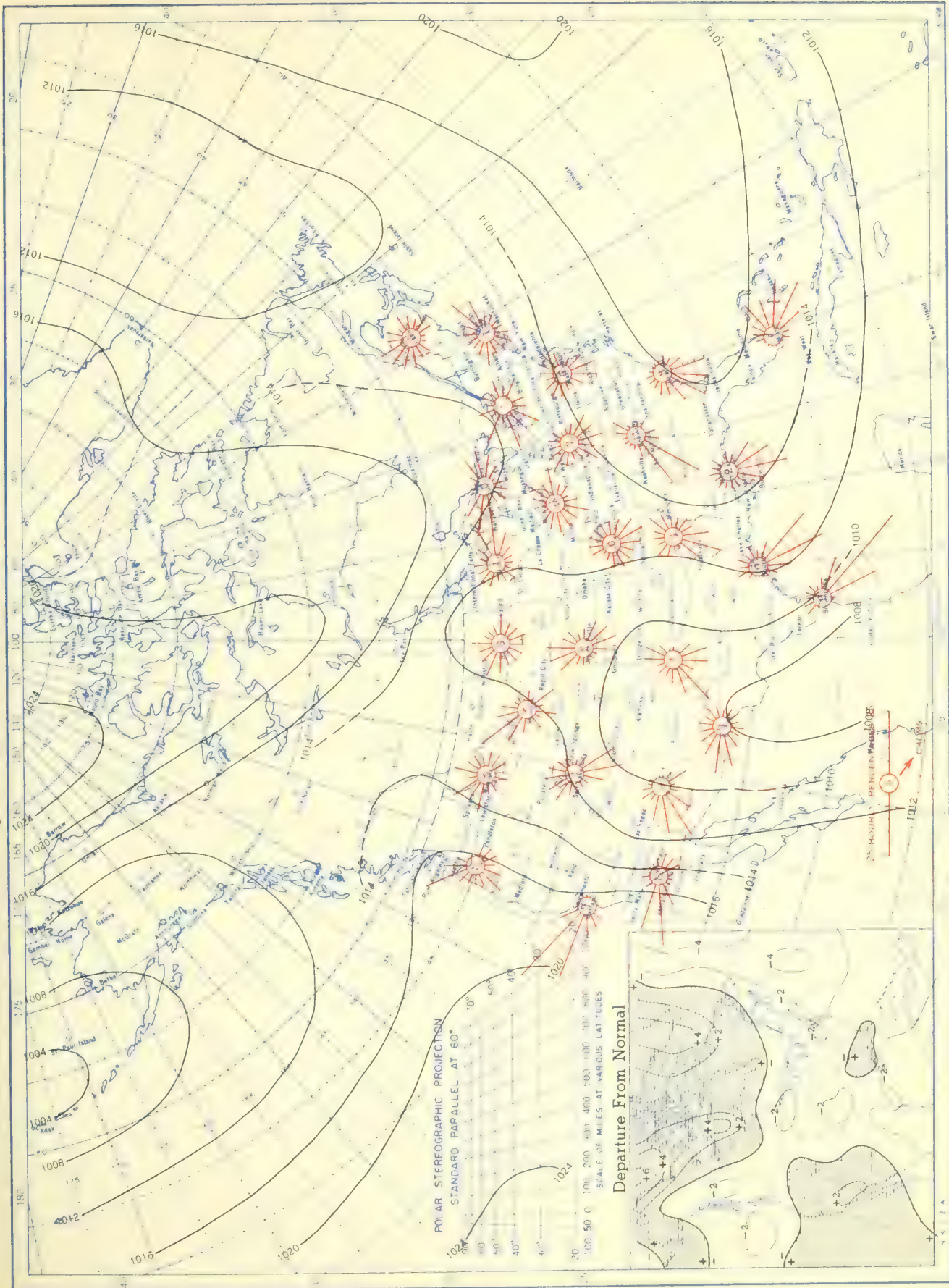


Chart X. Tracks of Centers of Cyclones at Sea Level, May 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, May 1953. inset: Departure of Average Pressure (mb.) from Normal, May 1953.



Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° inter-sections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

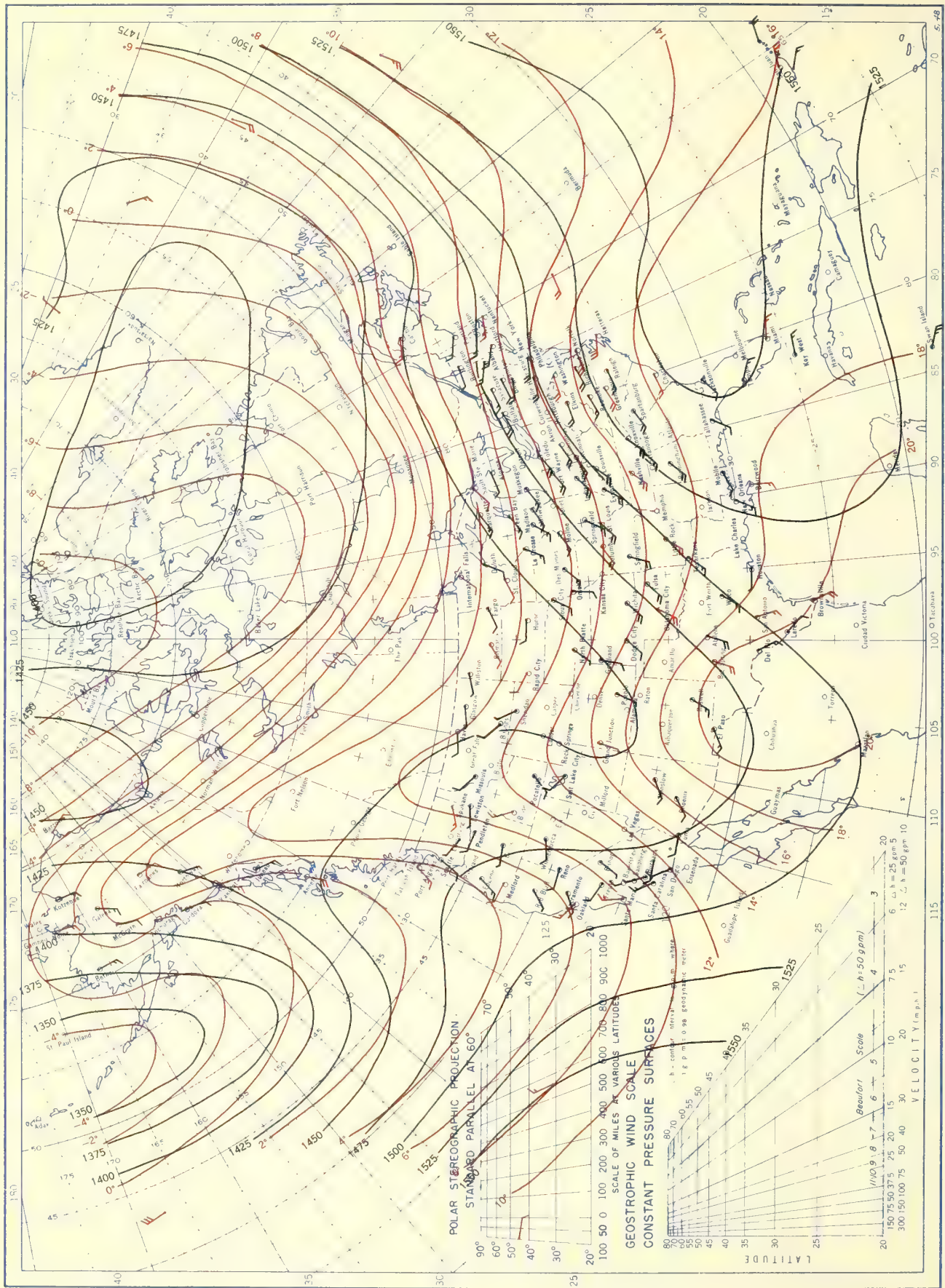
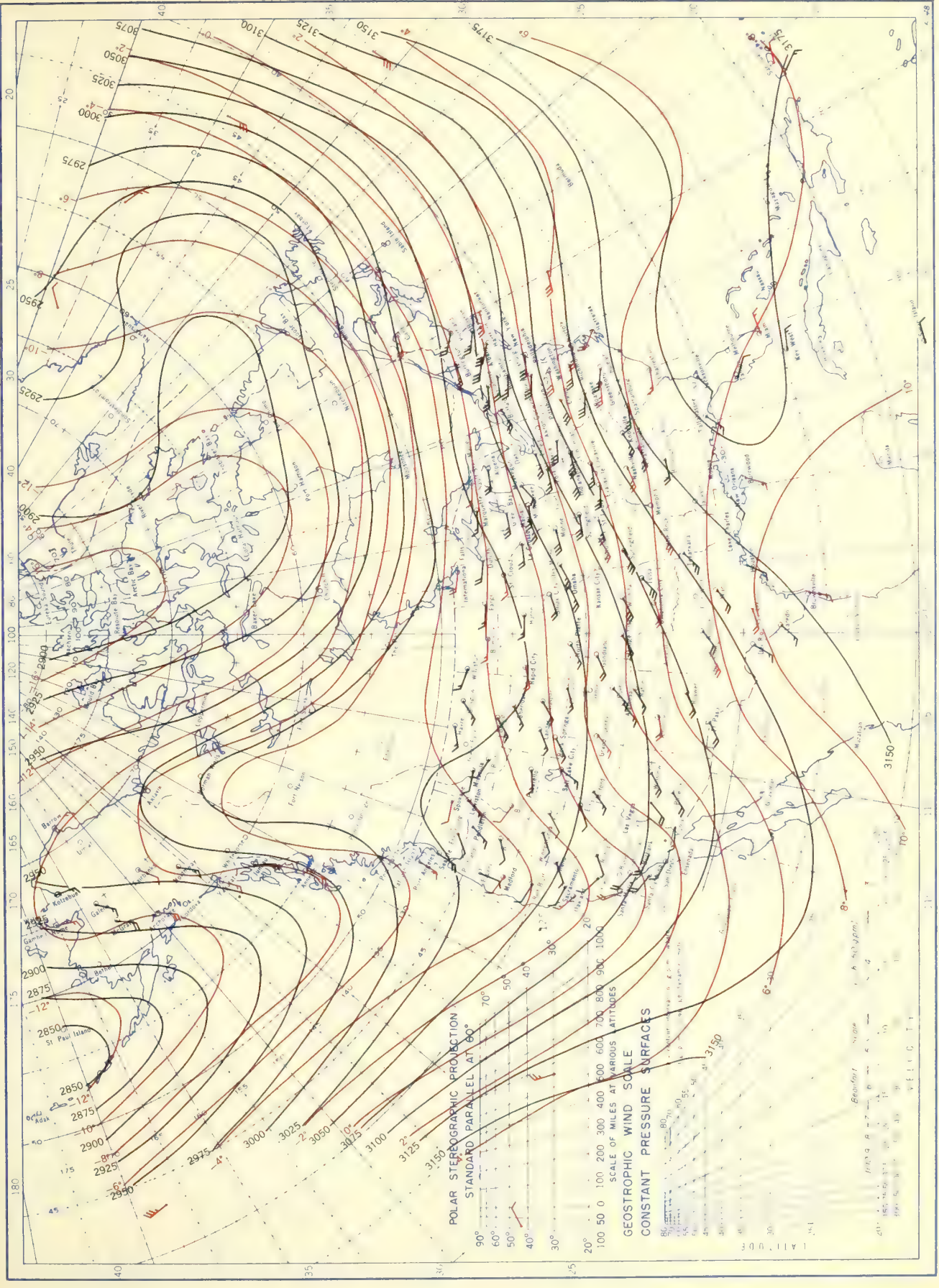




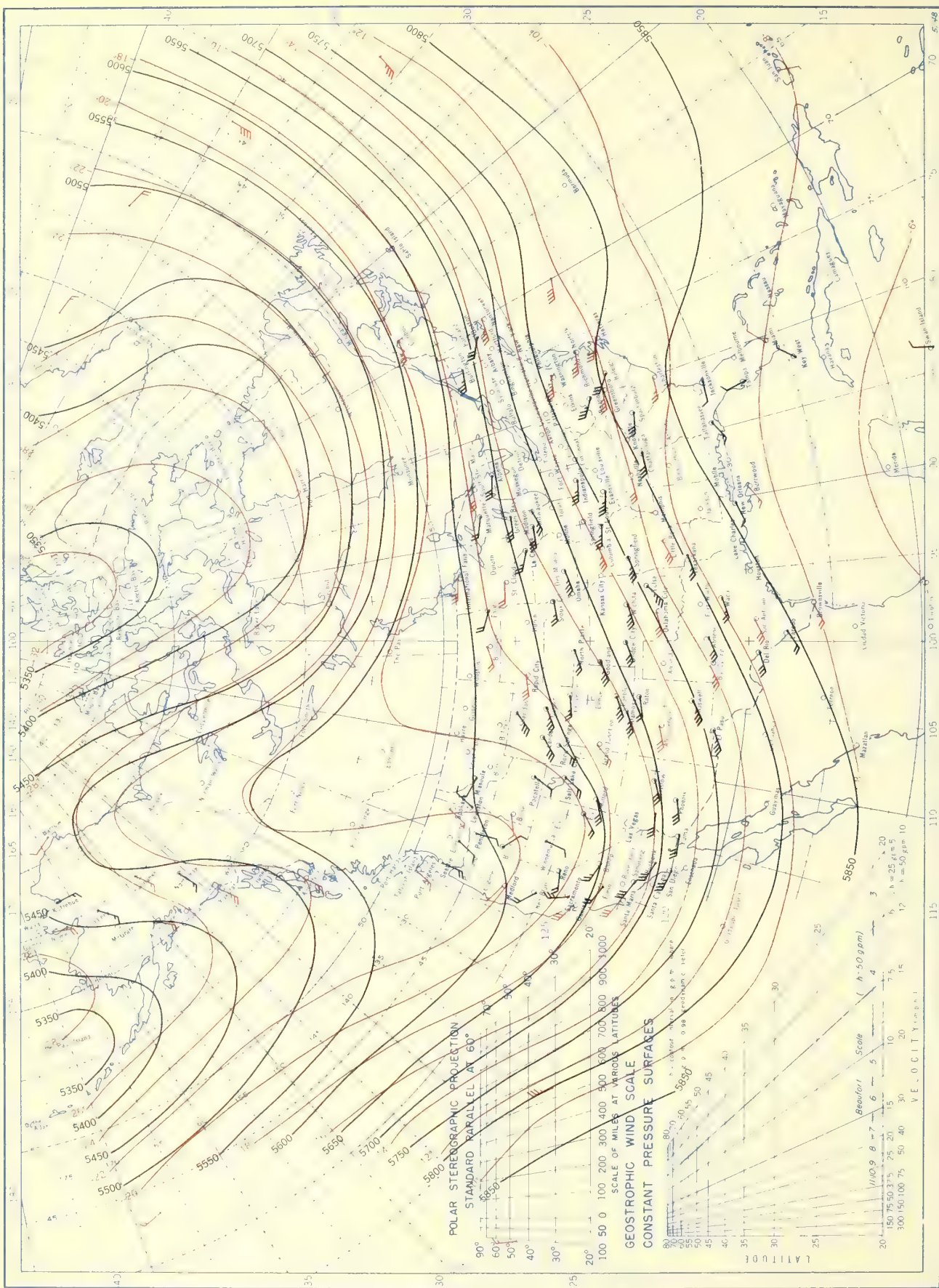
Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 700-mb. pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), May 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.



Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), May 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

Pressure surface of the 500 mb. is shown in black. Isotherms of the 500 mb. are shown in red. Resultant winds at 5000 meters are shown in black. Winds at 0300 G.M.T. are shown in red.









U. S. DEPARTMENT OF COMMERCE

SINCLAIR WEEKS, Secretary

WEATHER BUREAU

F. W. REICHELDERFER, Chief

AGRICULTURAL RESEARCH DEPARTMENT  
CLARKSON COLLEGE LIBRARY

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

JUNE 1953

Volume 4 No. 6



ASHEVILLE: 1953



# C O N T E N T S

SURFACE DATA	Page
General Summary of Weather Conditions-----	165
Condensed Climatological Data - States-----	167
Climatological Data - Stations-----	168
Heating Degree Days-----	173
Monthly and Seasonal Heating Degree Days - 1952-1953-----	174
Severe Storms-----	178
General Summary of River and Flood Conditions-----	206
Flood Stage Data-----	209
UPPER AIR DATA	
Radiosonde Data-----	210
Pilot Balloon Data-----	213
Rawin Data-----	214
SOLAR RADIATION DATA	
Solar Radiation Intensities-----	215
Blue Hill Data-----	216
Daily Totals and Average Daily Totals by Weeks-----	217
Daily Illumination on a Horizontal Surface-----	219
DELAYED DATA-----	220
CHARTS I-XV	

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

SUBSCRIPTION PRICE: Monthly and annual, 15 cents per copy; yearly subscription, including monthly and annual issues, \$1.50. Checks and money orders should be made payable to the "Treasurer of the United States." Remittance and correspondence regarding subscriptions should be sent to "Superintendent of Documents, Government Printing Office, Washington 25, D.C."

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

Volume 4 No. 6

JUNE 1953

### GENERAL SUMMARY OF WEATHER CONDITIONS

Although June was characterized by unusual weather situations in several sections of the Country, the outstanding features were the heat and drought in the south-central interior. Extremely hot, dry weather, which began in this area during the second half of May, continued throughout June, and at the end of the month drought seriously threatened crops in an area extending from the lower Ohio and central and lower Mississippi Valleys westward to the Rocky Mountains. The drought was most serious in the Rio Grande Valley and western portions of Texas and Oklahoma where, in many sections, ranges were bare, early planted crops were either completely destroyed or damaged beyond recovery, and water supplies for both farms and cities were critically low. The Rio Grande River at Del Rio, Tex., ceased flow for the first time in recorded history, and the Cimarron River at Perkins, Okla., registered its lowest average monthly stage of record. This weather was favorable for harvesting operations, however, and the small grain harvest was completed earlier than usual.

Deficient rainfall and extremely high temperatures during the last decade also affected crops adversely in large sections of the Northeast, particularly in New York and New England. Serious droughty conditions developed in central Vermont and New Hampshire and in the latter area forest fires burned over large wooded sections. These droughty conditions in New England were in sharp contrast to the weather of the preceding five months when precipitation was much above normal for all except February and averaged 150 percent of normal (a new record) for the 5-month period.

Cold, wet weather prevailed in the Pacific Northwest and much of California where low average temperatures retarded most crop growth and frequent mostly light to moderate rains, particularly during the first half, prevented timely accomplishment of field work. These conditions, however, were favorable for ranges and winter grains which were in good to excellent condition at the end of the month. Above-normal rainfall with the added effect of warm weather in the north-central interior provided excellent growing conditions for crops, but heavy rains caused damaging floods in parts of Montana, Iowa, and Minnesota. In the South Atlantic States, June rains relieved the heat and drought that had developed during May. In the far Southwest unusually windy weather prevailed for the third consecutive month. In Arizona the monthly wind speeds averaged 8.1 m.p.h. (a new June record) at Yuma, and maximum wind speeds ranged from 20 to 52 m.p.h. on 26 days at Winslow.

June thunderstorms were more frequent than usual in the north-central interior and parts of the Northeast and often were accompanied by damaging wind, hail, lightning, and tornadoes. Some of these latter storms were among the most destructive on record.

Sunshine was well below normal in much of the Pacific Northwest (Portland, Ore., recorded less

than half of normal) and slightly deficient in the north-central interior, New Mexico, Georgia, and Florida, but well above normal elsewhere, particularly in extreme southern Texas where Corpus Christi received 95 percent of the amount possible and in the lower Mississippi Valley where St. Louis, Mo., recorded the greatest amount there for any June in the last 59 years.

PRECIPITATION.—June rainfall was less than 50 percent of normal in nearly all of the south-central interior, less than 25 percent in much of the area, and generally below 10 percent in the Rio Grande Valley, in western portions of Texas, and in an area including western Tennessee, northwestern Mississippi and eastern Arkansas. Statewide averages for June were only 17 percent of normal in Arkansas (second driest on record), 44 percent in Missouri (driest since 1936), and 47 percent in Texas (driest since 1934). In Kansas, June, with only 58 percent of normal rainfall, marked the end of the driest 10-month period in the history of the State. Numerous stations in Texas, 7 in Arkansas, 4 in Mississippi, and one in each of the States of Tennessee, Missouri, Kansas, and Oklahoma received no rain at all during June.

In the Rio Grande Valley and western Texas, where the drought was most severe, precipitation has been deficient for nearly three years except for short periods of temporary relief. At Brownsville, Tex., where the month's total rainfall was 0.01 inch, this June was the driest since 1915; also, it was the last month in the driest 7-month period in the station's record, which began in 1870; the Rio Grande River was dry from above Laredo to its mouth most of the month, resulting in no irrigation water and considerable crop loss. At Amarillo total rainfall was only 0.02 inch for June, which marked the end of the driest 10-month period in the station's history. Also, Abilene's total precipitation was only 12 percent of normal (0.21 inch) for June, 53 percent (4.46 inches) for the first 6 months of 1953, and 50 percent of normal (23.39 inches) for the past 33 months.

From Michigan westward to the Pacific Coast and in central and northern California, June precipitation generally was well above normal. Monthly totals ranged up to more than 10 inches in Michigan, Iowa, Minnesota, North Dakota, and Montana. In the central portion of the latter state 4 to over 8 inches of rain during the first week in June, following heavy rains during the latter part of May, produced floods that resulted in losses estimated near \$5,000,000, with heaviest damage occurring in Great Falls, Mont., and vicinity. In Minnesota, heavy thundershowers about the middle of the month caused an overflow of the Red River of the North in the locality of Moorhead and many small streams in the vicinity of New London; total flood losses, according to preliminary estimates, were placed at \$3,788,000. The floods in northwestern Iowa were produced by torrential downpours that measured 8.58 inches



JUNE 1953

(falling in approximately 14 hours) at Sheldon and 11 inches (unofficial) at Ritter. Flooding of creeks and rivers was general in the northwestern counties of the State, with many localities reporting the most severe flooding in local history. Losses were extremely heavy throughout the Floyd Valley, but the major portion occurred in Sioux City. Total damage in the Valley may reach \$50,000,000.

In Florida, Georgia, and the Carolinas where near-drought conditions prevailed at the end of May, relief came with light to locally heavy rains early in the month when a Gulf tropical storm which began moving northward from western Cuba on June 4 entered the mainland in northwestern Florida on the 6th. This was the heaviest rainfall in these States in many weeks. Additional intermittent rains occurred thereafter, and by the end of the month soil moisture was generally adequate and crops were in good condition except that the Florida corn crop was too far advanced to benefit from the rains.

**TEMPERATURE.**—The persistence of extremely high temperatures in south-central areas greatly intensified the effects of the drought. The most costly examples of this occurred in the lower Great Plains where the 100° mark was equaled or exceeded in Texas on 21 consecutive days at Abilene, 20 at Wichita Falls, and 5 at San Antonio, and on 26 days at Hollis, Okla. Extreme high temperatures set new June records at many stations, a few of which were Amarillo, Tex., 108° (also a record for any month) on the 24th; Dallas, Tex., 105° on the 12th; and 109° at Dodge City, Kans., on the 11th. The nights as well as days were also unusually hot, with minima frequently in the 80's; Kansas City, Mo., reported a record high June minimum of 85° during the night of the 19th and 20th. Average temperatures for the month also established new June records for many stations including Memphis, Tenn., where the average of 85.6° was the highest for any month in the Memphis record. Statewide averages of 85.3°, 85.1°, and 83.4° were the highest of record for Oklahoma, Texas, and Arkansas, respectively, and 83.3° for Mississippi equaled the previous June record established there in 1914. This heat wave overspread the Great Lakes region and the Northeast at the beginning of the last decade when record high temperatures for June were equaled or exceeded at Chicago, Ill., Grand Rapids and Detroit, Mich., and Albany, N. Y.

This was one of the coldest Junes ever experienced in most of California and the Northwest. Statewide June averages were the lowest on record for Oregon, the second lowest for Washington, and the fourth lowest for California and Idaho. The cold weather in this region was marked especially by persistent unusually low daily maxima. For example, at Fresno, Calif., daily maxima were below normal from May 14 through June 15, a 32-day period, and on June 1 the reading was only 60°, which was 28° below normal. Also, as a June maximum for Oregon, 91° was the lowest on record, and 89° in Washington equaled the record for that

State. At Lewiston, Idaho, daily averages were below normal on all but one day. Frost occurred at intervals throughout the month in scattered high sections of the Mountain States but no serious damage was reported.

In most sections of the Country the lowest monthly temperatures occurred during the first week, including 16° recorded at Fraser, Colo., on the 3d., although at scattered stations in the northern Rockies, these extremes for the month were recorded during cold snaps about the middle of the month and on the 24th and 25th. Highest monthly temperatures for individual stations generally occurred on the 1st in the South Atlantic States, about the middle of the month west of the Great Lakes, and elsewhere at various dates during the second half. The month's highest temperature, 118°, was recorded in southern California in Barrego Valley and at El Centro on the 24th. The highest temperature east of the Rocky Mountains was 117° at Hollis, Okla., on the 14th; this was also the highest temperature ever recorded in Oklahoma during June.

**DESTRUCTIVE STORMS.**—For the third consecutive month the tornado was the most destructive type of storm. This month, according to preliminary estimates, it caused 244 deaths, 2,644 injuries, and property losses of \$77,828,000. The major portions of these losses occurred in thickly populated sections of Ohio and Michigan on the 8th and New England on the 9th.

Several damaging tornadoes occurred also in Michigan on the 8th, the worst one in the vicinity of Flint where 116 persons were killed, 867 injured, and property damaged to the extent of \$19,000,000. Of recorded tornadoes this one killed more people in the State than all previous Michigan tornadoes combined. Other Michigan tornadoes on the same date struck near Erie, Milford, Spruce, and Twas, killing 4 persons, injuring 33, and causing about \$1,000,000 damage. Also on the same date a tornado crossed northern Ohio leaving 17 dead, 400 injured, and nearly \$20,000,000 in property damage, a major portion of it in western Cleveland.

On the 9th the most destructive tornado in the history of New England (also caused more property damage than any other single tornado in the history of the United States) struck in central and eastern Massachusetts, killing 90 persons, injuring 1,288, and causing property damage estimated at \$52,143,000. On the same day 2 other twisters occurred, one causing \$100,000 damage and 5 injuries in New Hampshire, and the other, 17 injuries and \$671,000 damage in southeastern Massachusetts.

Other severe storms during the month caused nearly 50 additional deaths and 200 injuries, and over \$50,000,000 damage. Wichita, Kans., suffered \$12,000,000 of this additional loss on the evening of June 21 when two storms struck the city. The first lasted from 6 p.m. to 6:50 p.m. and the second from 9:25 to 9:35 p.m. Hail fell over the city during the first storm and winds in both storms reached 100 m.p.h.

# CONDENSED CLIMATOLOGICAL SUMMARY

JUNE 1953

Table 1

Section	Temperature							Precipitation						
	Average	Departure from normal	Monthly extremes					Average	Departure from normal	Monthly extremes				
			Station	Highest	Date	Station	Lowest			Date	Station	Greatest	Station	Least
	*F	*F		*F			*F	In	In		In		In	
Alabama	80.9	+2.4	Tuscaloosa CAA AP	104	19	2 Stations	48	3	4.03	-0.26	Fairhope	10.35	Farley	0.28
Arizona	75.7	+1.3	2 Stations	116	"22	do	22	3	.15	-.20	Bowie	1.19	85 Stations	.00
Arkansas	83.4	+6.3	do	108	"19	Mammoth Spring	51	3	.63	-3.48	Stuttgart	4.76	7 Stations	.00
California	66.1	-3.5	do	118	"23	Twin Lakes	17	2	.51	+2.1	Round Mountain	4.37	108 Stations	.00
Colorado	65.4	+3.9	Eversoll Ranch	113	"24	Fraser	16	3	.94	-.51	Grover 1W	4.11	Gardner	.06
Connecticut	67.4	+1.3	Windsor Locks CAA AP	99	"21	Mansfield Hollow Dam	32	3	2.53	-1.01	Prospect	5.28	New London	.32
Delaware	72.0	+4.3	3 Stations	95	"21	Del. City Reedy Pt.	42	2	2.75	-1.03	Milford	4.03	Dover	1.64
Florida	80.7	+7.4	4 Stations	102	"1	Jasper 10E	55	4	7.92	+1.26	Lake Placid 2SW	27.27	Daytona Beach WB AP	1.37
Georgia	79.5	+8	Camilla	105	"1	Blairsville Exp Sta.	40	3	4.76	+3.2	Thomasville	8.74	Resaca	1.42
Idaho	57.1	-3.2	Cambridge	96	"29	3 Stations	24	"8	1.67	+3.5	McCall	3.63	Glenns Ferry	.37
Illinois	77.1	+5.0	Palestine	108	"20	Freeport	40	2	3.42	-.60	Grand Tower	7.31	Elizabethtown	1.14
Indiana	75.3	+4.1	Ellistown	106	"21	Wheatfield	39	2	2.72	-1.24	Wheatfield	6.88	Boonville 2E	.12
Iowa	73.2	+3.7	2 Stations	105	"18	Inwood 2W	37	"5	5.31	+7.7	Cherokee	11.52	Columbus Junction	2.20
Kansas	81.1	+7.3	4 Stations	112	"13	Tribune	41	8	2.29	-1.68	Geneseo	6.16	Richfield 4N	.00
Kentucky	77.1	+3.1	do	102	"20	Inez	41	3	3.42	-.77	McKee 1SE	10.23	Owensboro 2W	.46
Louisiana	83.4	+3.4	Plain Dealing	106	"23	Tallulah Delta Lab.	57	3	3.63	-.65	Amite	14.04	Andrew	.10
Maine	62.9	+1.3	2 Stations	95	"20	Ripogenus Dam	25	4	2.32	-1.13	Old Town	3.92	Portland	.70
Maryland	72.0	+1.1	do	99	"6	Oakland	35	3	2.31	-1.67	Baltimore WB City	6.49	Friendsville 2W	.44
Massachusetts	66.9	+1.6	do	99	"20	West Cummington	28	3	1.59	-1.91	Tully Dam	5.40	Ryanis	.08
Michigan	65.9	+2.0	Hastings	104	"20	Watersmeet	28	7	3.77	+3.6	Stambaugh	10.17	Hale Five Chan Dam	1.41
Minnesota	66.0	+1.6	Winona	103	"20	Angus 1NE	26	6	6.18	+2.09	New London	13.73	Highlanding	2.73
Mississippi	83.3	+4.3	Clarksdale	107	"19	4 Stations	56	"2	2.45	-1.68	Van Cleave	11.23	4 Stations	.00
Missouri	80.4	+7.1	3 Stations	106	"18	Black	45	3	2.14	-2.66	Weingarten	6.34	Seligman	.00
Montana	58.8	-1.7	Moorhead 1S	100	"30	Harlowton	24	25	3.33	+5.3	Shonkin 7S	11.13	Belfry 8SSW	.19
Nebraska	74.0	+4.7	3 Stations	108	"18	3 Stations	36	"3	3.22	-.58	Mitchell 5E	7.13	Max 8NE	.98
Nevada	62.8	-2.4	Overton	114	"24	Fish Creek Ranch	23	25	.52	.00	Sheldon	2.13	8 Stations	.00
New Hampshire	64.8	+1.7	2 Stations	99	"20	1st Conn Lake	28	3	1.22	-2.40	1st Conn Lake	4.09	West Lebanon	.07
New Jersey	70.3	+1.1	Paterson	103	"22	Layton 3NW	34	2	2.83	-.96	Clayton	5.60	Sandy Hook	1.14
New Mexico	73.1	+3.4	Jal	111	"24	Red River	18	7	.63	-.56	Sandia Park	3.04	9 Stations	.00
New York	66.0	+8	2 Stations	100	"21	Speculator	22	3	1.98	-1.54	Balsam Lake	6.84	Ticonderoga	.00
North Carolina	74.9	+1	do	100	"1	Celo 2S	33	3	5.80	+1.14	Wilson	12.04	Southport	1.31
North Dakota	63.0	-.1	Wilton RR Station	98	"13	3 Stations	28	"6	5.45	+1.94	Jamestown CAA AP	11.31	Bottineau	2.54
Ohio	72.6	+2.8	Cincinnati-Hartwell	102	"30	Willport 2NW	34	2	2.81	-1.14	Norwich	6.18	Athens 5NW	.46
Oklahoma	85.3	+7.7	Hollis	117	"14	Kenton	49	"8	2.21	-1.81	Roosevelt	8.76	Texhoma	.00
Oregon	55.1	-4.7	Richland	91	"29	Fremont	17	6	1.78	+3.5	2 Stations	5.40	McNary Dam	.37
Pennsylvania	68.9	+7.2	2 Stations	100	"22	Kane INNE	31	2	2.88	-1.23	Palm	6.76	Confluence 1SW Dam	.69
Rhode Island	66.7	+2.0	Greenville	95	"20	Kingston	37	3	.75	-2.19	Greenville	1.48	Kingston	.47
South Carolina	78.3	+4	Tilghman Forest Nrsy.	105	"1	2 Stations	44	3	4.61	-.04	Caesars Head	12.10	Blairs	.80
South Dakota	68.0	+1.9	2 Stations	106	"18	Deerfield Dam	29	26	4.79	+1.19	Milbank	9.94	Buffalo Gap	1.62
Tennessee	79.0	+4.1	Covington	104	"19	Greenville Exp. Sta.	45	3	2.51	-1.72	Newcomb	9.15	Moscow	.00
Texas	85.1	+5.5	Memphis	115	"15	2 Stations	50	5	1.11	-1.68	Bay City	8.84	Numerous Stations	.00
Utah	64.9	+4	2 Stations	107	"22	Coon Peak KSL TV	19	1	.43	-.27	Mountain Dell Dam	1.95	7 Stations	.00
Vermont	64.5	+1.3	Vernon	98	"21	Lemington	26	3	1.82	-1.89	Enosburg Falls	3.73	Woodstock 2SW	.06
Virginia	73.0	+1.1	4 Stations	97	"23	Monterey	35	"1	3.76	-.38	Cleveland	9.92	Ashtland 1SW	1.11
Washington	56.8	-4.0	3 Stations	89	"11	Rainier Paradise RS	28	"2	1.94	+3.3	Cedar Lake	7.67	Wapato	.18
West Virginia	71.5	+1.6	Brownsville	101	"21	2 Stations	30	"2	4.27	-.25	Point Pleasant	9.14	Upper Davison Run	.83
Wisconsin	67.1	+2.3	2 Stations	102	"20	Land O'Lakes	28	7	4.92	+7.3	Eagle River 4W	9.92	Racine	1.60
Wyoming	60.9	+2.2	do	104	"29	3 Stations	19	25	1.64	-.18	Weston	6.08	Leo 6SW	T
Hawaii	72.4	-.5	Puunene CAA AP	94	"7	Kole Kole	37	"1	2.89	-1.21	Lanikai	14.19	21 Stations	.00

\* Other dates also.



## CLIMATOLOGICAL DATA

JUNE 1953

Table 2

State and station	Elevation (ground)	Pressure			Temperature										Precipitation										Wind					No. of days (sunrise to sunset)				
		Station	Sea level	Average maximum	Average minimum	Average	from normal				No. 90° F. or above	No. 32° F. or below	Average dew point	Average relative humidity		from normal				No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile			Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine	
							Departure from normal	Highest	Date	Lowest				Date	Total	In.	In.	Greatest in 24 hours	Greatest in 24 hours	0.1 inch or more	With thunderstorms	Total	Max. depth on ground			Speed	Direction	Direction						Direction
Fl.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.	°F.		°F.	%	In.	In.	In.			In.	In.	M.	M.														
ALABAMA																																		
Anniston	599	994.2	1016.1	92	67	79.1	+1.1	99	10	52	3	19	0	69	--	3.96	-0.03	1.53	6	11	T	0	4.7	NE	*30	NNW	13	9	13	8	5.2			
Birmingham	610	992.2	1016.8	93	70	81.4	+4.0	99	20	59	4	21	0	67	65	1.22	-2.99	.70	7	5	.0	0	7.6	SE	36	NE	13	8	15	7	5.0			
Mobile	211	1007.8	1015.7	93	73	83.2	+3.6	101	19	68	20	25	0	72	77	6.11	+1.16	2.75	14	19	.0	0	8.9	S	---	---	---	7	17	6	5.9			
Montgomery CO	201	-----	-----	92	72	81.8	+1.6	98	21	65	3	21	0	---	---	2.97	-1.52	.70	9	4	.0	0	---	---	---	---	---	---	---	---	---	---		
Montgomery	198	1008.1	1015.5	93	71	81.7	+2.1	98	1	61	4	22	0	71	73	3.18	-1.51	.72	7	9	.0	0	4.7	E	51	NW	10	8	11	11	5.8			
ARIZONA																																		
Flagstaff	6993	788.0	1014.6	78	40	59.0	+7	88	23	28	2	0	3	---	---	T	-.53	T	0	0	.0	0	---	---	---	---	---	23	4	3	2.1			
Phoenix CO	1083	-----	-----	102	71	86.4	+1.4	111	23	60	2	28	0	---	---	.00	-.06	.00	0	0	.0	0	7.1	---	---	W	1	---	---	---	---			
Phoenix	1114	969.5	1007.6	101	69	85.0	+1.1	111	30	58	2	28	0	41	23	T	-.06	T	0	0	.0	0	6.3	E	*25	S	1	24	6	0	1.8			
Prescott	5014	846.3	1010.2	87	53	70.0	-.1	97	30	39	2	16	0	21	19	T	-.23	T	0	0	.0	0	12.7	SW	43	SW	1	24	5	1	1.7			
Tucson	2558	922.1	1007.8	100	68	84.1	+2.0	109	22	54	2	29	0	38	18	.03	-.27	.03	1	3	.0	0	7.3	W	29	E	11	22	7	1	1.9			
Winslow	4880	850.3	1008.1	92	54	73.3	+1.9	100	22	41	2	20	0	24	19	T	-.29	T	0	2	.0	0	10.9	WSW	*52	SSW	1	23	5	2	2.2			
Yuma	199	1002.4	1007.4	103	69	85.8	+2	113	23	55	2	29	0	38	23	T	-.01	T	0	0	.0	0	8.1	SW	26	SW	1	28	2	0	9			
ARKANSAS																																		
Fort Smith	458	996.6	1013.1	98	71	84.6	+6.3	105	19	65	*5	29	0	67	58	.51	-3.80	.46	3	2	.0	0	7.9	NE	38	NW	5	22	5	3	2.5			
Little Rock	257	1002.0	1014.0	96	74	85.2	+6.7	102	20	63	3	28	0	69	61	.12	-3.31	.06	2	4	.0	0	8.5	SSW	60	NE	11	20	7	3	3.2			
Texarkana	361	1000.7	1013.9	96	73	84.6	+4.7	102	21	68	1	28	0	70	64	.30	-3.55	.16	3	2	.0	0	7.0	S	---	---	---	23	4	3	2.7			
CALIFORNIA																																		
Bakersfield	489	995.6	1013.6	87	58	72.5	-4.4	102	23	51	*2	12	0	45	40	T	-.09	T	0	0	.0	0	7.0	NNW	*27	NW	18	22	5	3	2.1			
Beaumont CO	2589	-----	-----	84	48	66.0	-2.4	101	22	40	10	12	0	---	---	.05	-.09	.02	3	0	.0	0	---	---	---	---	---	21	6	3	2.4			
Bishop	4108	870.3	1008.8	89	47	68.0	-1.4	100	22	33	2	16	0	---	---	.03	-.07	.02	2	2	.0	0	---	---	---	---	---	21	5	4	2.2			
Blue Canyon	5280	839.1	1014.2	62	45	53.5	-5.5	81	17	34	*8	0	---	---	1.78	+7.74	1.04	8	1	.0	0	---	---	---	---	---	14	5	11	4.5				
Burbank	699	987.1	1013.3	79	55	66.7	-.8	90	13	45	2	2	0	51	63	.01	-.06	.01	1	0	.0	0	3.7	S	*14	SSE	10	19	3	8	3.7			
Eureka CO	43	1017.3	1019.6	59	49	54.1	-1.5	63	13	44	24	0	---	---	1.24	+5.93	.6	0	.0	0	0	0	8.4	---	---	27	N	17	10	9	11	5.6		
Fresno	331	1001.0	1012.8	84	55	69.3	-6.4	99	23	46	2	1	0	46	49	.32	-.21	.31	2	0	.0	0	7.6	NW	22	NW	7	21	6	3	2.2			
Los Angeles	312	-----	-----	76	57	66.3	-1.0	87	29	50	4	0	---	---	.06	.01	.05	0	0	.0	0	5.6	---	---	---	---	18	4	7	3.6				
Los Angeles	99	1009.5	1013.4	71	57	64.1	-.6	78	29	51	2	0	0	55	73	.T	-.07	T	0	0	.0	0	6.5	WSW	124	W	*8	13	12	5	4.1			
Mt Shasta	3543	892.3	1015.8	68	43	55.2	-4.6	79	17	35	*8	0	---	---	.81	-1.42	.47	5	0	T	0	---	---	---	---	---	---	---	14	6	10	4.6		
Oakland	3	1015.6	1016.0	70	52	60.9	-.7	90	24	48	*3	1	0	50	70	.53	+3.38	.51	2	0	.0	0	8.5	W	*25	NNW	28	18	7	5	3.5			
Red Bluff	341	1001.0	1013.6	84	58	70.7	-5.3	100	17	49	*9	8	0	43	43	1.13	+6.7	.78	4	2	.0	0	9.5	NNW	32	NW	16	16	5	9	3.9			
Sacramento	17	1012.9	1013.7	82	52	67.3	-3.0	98	22	45	9	6	0	47	55	.63	+5.52	.63	2	0	.0	0	10.3	SW	32	SW	18	20	4	6	2.9			
Sandberg CO	4517	861.8	1012.6	70	48	59.2	-5.6	70	22	37	5	1	0	35	50	T	-.10	T	0	0	.0	0	19.2	SW	32	SW	4	14	10	5	3.0			
San Diego	19	1009.1	1013.5	71	59	66.3	-.2	77	13	55	4	0	0	55	73	.T	-.14	.10	.08	2	0	.0	0	7.3	SW	20	SW	4	14	10	5	3.1		
San Francisco CO	52	-----	-----	64	51	57.8	-1.3	86	24	48	3	0	0	---	---	.61	+4.6	.59	3	0	.0	0	10.6	---	---	34	W	28	16	9	5	3.3		
San Francisco	1	1015.2	1016.0	67	50	58.6	-1.1	88	24	46	21	0	0	49	75	.34	+2.1	.33	3	0	.0	0	15.9	NNW	42	NNW	15	18	6	6	3.4			
Santa Maria	231	1006.4	1015.1	70	46	57.8	-2.3	82	13	41	2	0	0	48	73	.08	-.06	.08	2	1	.0	0	7.8	W	*25	NNW	4	19	8	3	3.2			
COLORADO																																		
Alamosa	7534	773.8	1014.7	81	44	62.4	+3.8	88	22	30	3	0	2	---	---	.43	-.06	.33	5	7	T	T	---	---	---	---	---	14	11	5	4.0			
Colorado Springs	6175	811.0	1011.3	82	53	67.5	+2.5	99	29	47	*2	5	0	38	42	1.39	-.49	.71	12	T	T	T	13.5	SSE	*45	SSW	2	11	12	7	4.6			
Denver	5292	835.8	1009.3	84	55	69.7	+3.3	99	29	40	5	12	0	42	43	1.46	-.18	.81	9	8	5	1	9.1	S	40	S	2	15	7	8	4.6			
Grand Junction	4849	856.8	1005.5	89	59	74.0	+2.8	98	23	45	3	16	0	31	24	.17	-.28	.10	3	5	.0	0	12.5	ESE	42	S	26	16	9	5	3.4			
Pueblo	4799	855.4	1009.9	90	57	73.5	+4.4	101	10	47	*3	19	0	44	42	.44	-.96	.23	6	7	.0	0	8.2	NW	52	NW	13	15	6	9	4.4			
CONNECTICUT																																		
Bridgeport	7	1015.6	-----	78	59	69.4	+2.5	95	21	48	15	2	0	---	---	2.36	-1.11	1.12	5	4	.0	0	---	---	---	---	---	10	13	7	4.8			
Hartford	15	1010.2	1015.8	83	56	69.5	+1.8	96	21	41	15	5	0	56	65	.308	-.68	1.56	8	7	T	T	7.1	S	28	S	26	10	10	10	8	5.1		
New Haven	6	1011.9	1015.9	77	57	67.2	+1.4	93	21	45	15	1	0	---	---	2.21	-1.60	1.15	8	8	.0	0	6.4	---	---	25	E	13	10	12	8	5.5		
DELAWARE																																		
Wilmington	73	1013.5	1016.6	83	61	72.2	+4	94	21	49	*2	8	0	61	70	2.52	-1.50	1.07	7	6	.0	0	7.7	WSW	---	---	---	11	11	8	5.1			
FLORIDA																																		
Apalachicola CO	13	1013.9	1014.9	87	75	80.7	+8	96	18	68	11	3	0	---	---	8.60	+3.13	3.38	13	6	.0	0	8.6	---	47	NE	11	9	8	13	5.5			
Daytona Beach	33	1014.9	1016.4	88	72	79.7	+6.6	96	18	66	10	5	0	72	80	1.37	-5.32	.45	10	7	.0	0	10.4	E	*28	SW	18	4	17	9	5.8			
Fort Myers	15	1014.9	1015.4	90	72	80.9	+3	94	3	66	10	19	0	73	81	12.81	+3.61	5.70	16	16	.0	0	8.5	E	*34	SSW	18	3	9	18	7.4			
Jacksonville CO	18	-----	-----	88	73	80.8	+6	98	1	68	14	12	0	---	---	2.35	-4.32	.87	11	---	.0	0	---	---	---	---	---	---	---	---	---	---		
Jacksonville	52	1015.6	1016.7	90	72	80.9	+6	100	1	67	10	15	0	71	74	3.29	-3.53	.98	9	5	.0	0	9.9	ESE	45	N	14	6	14	10	6.3			
Key West CO	5	1014.2	1014.9	87	75	81.3	-1.3	92	18	73	21	3	0	---	---	6.40	+2.39	2.37	16	8	.0	0	8.2	---	25	NE	4	5	13	12	6.4			
Key West	6	1014.6	1014.9	88	76	81.9	-.3	91	13	72	21	0	0	73	75	5.79	+1.76	1.47	16	7	.0	0	12.3	E	---	---	---	4	12					

See footnotes at end of table.



## CLIMATOLOGICAL DATA

Table 2-Continued

JUNE 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation						Wind				No. of days		Possible sunshine																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal				Date	Lowest	Date	No. of days	No. of days	Snow, Sleet, Hail	Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
							Highest	Date	Lowest	Date																	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
INDIANA (Cont.)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				



## CLIMATOLOGICAL DATA

JUNE 1953

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature										Precipitation										Wind				No. of days		Possible sunshine	
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days 90° F or above	Min 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days 1/4 inch or more	Snow, Sleet, Hail	Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)		
Ft.	Mb.	Mb.	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	In.	In.	In.	0.1 inch or more	With thunderstorms	Total	In.	In.	M. p. h.	M. p. h.								
NEW HAMPSHIRE																															
Concord	339	1004.1	1014.8	82	50	65.8	+1.7	98 20	35	1	7	0	51 61	2.64	-0.98	2.27	7	6	0.0	0	6.5	NW	29	NW	11	9	13	8	5.2	71	
Mt. Washington	6262	808.4	1019.6	52	38	45.1	+7	64 22	21	3	0	10	84	3.60	-2.66	.96	13	3	T	0	28.1	W	190	W	9	5	14	11	6.8	51	
NEW JERSEY																															
Atlantic City CO	8	1014.2	1015.9	74	63	68.2	-.5	90 23	52	2	1	0	---	---	2.76	-.23	1.41	8	3	.0	0	14.1	---	35	NW	22	12	9	9	4.4	70
Newark	11	1014.9	1016.2	83	64	72.7	+2.2	100 21	50	2	9	0	58 62	1.79	-.201	.67	7	7	0	0	9.4	SW	*30	NW	22	12	12	7	4.9	70	
Trenton CO	56	1009.5	1016.3	82	62	72.0	+1.2	93 21	49	1	8	0	---	---	2.53	-1.34	1.47	7	6	.0	0	8.5	---	29	N	22	12	12	6	4.8	73
NEW MEXICO																															
Albuquerque	5310	847.6	1007.3	93	63	78.1	+3.2	100 23	52	3	22	0	34 26	.35	-.37	.35	1	4	.0	0	8.7	SE	42	S	10	19	6	5	3.3	81	
Clayton	4969	846.9	1008.5	91	61	76.1	+6.5	100 24	50	5	24	0	---	---	.38	-1.53	.38	1	3	T	---	---	---	---	---	---	---	---	---	---	---
Raton	6379	805.6	1009.8	87	52	69.6	+5.7	95 22	40	8	12	0	---	---	.81	-.91	.30	7	8	T	---	---	---	---	---	---	---	---	---	---	---
Roswell	3612	890.6	1008.5	99	64	81.5	+4.7	107 23	51	6	29	0	43 31	.48	-.99	.29	4	7	.0	0	12.0	---	47	W	9	19	10	1	2.7	---	
NEW YORK																															
Albany	277	1011.5	1015.1	82	55	68.5	+1.5	97 20	38	3	7	0	54 61	1.92	-1.45	1.69	7	6	.0	0	8.4	S	43	NW	28	10	9	11	5.2	71	
Binghamton	1601	958.3	1016.7	77	54	65.5	+1.3	93 21	44	12	2	0	54 69	2.50	-1.15	1.20	10	8	.0	0	9.8	NW	42	W	9	5	16	9	5.1	76	
Buffalo	693	988.5	1016.4	78	57	67.5	+2.0	93 21	44	3	2	0	56 69	.98	-1.72	.68	6	5	T	T	12.1	SW	49	SW	25	6	11	13	6.2	72	
New York CO	10	1004.7	1015.0	80	63	71.6	+1.8	94 21	53	14	3	0	---	---	1.42	-2.28	.50	7	6	.0	0	11.4	---	57	SW	9	10	13	7	4.7	76
New York	19	1014.6	1016.3	83	64	73.6	+2.6	97 21	53	14	7	0	58 61	1.77	-1.61	.73	6	6	.0	0	9.7	SW	40	NW	9	12	12	6	4.9	70	
Rochester	543	997.0	1015.9	80	56	68.2	+1.6	100 21	44	3	5	0	56 68	1.70	-1.15	.71	8	6	.0	0	9.6	SW	34	W	5	7	16	7	5.6	72	
Schenectady	217	1014.7	1015.9	82	58	70.1	+2.1	96 20	42	3	6	0	---	---	1.71	-2.15	1.54	6	2	.0	0	---	---	---	---	---	---	---	---	---	---
Syracuse	399	994.6	1016.3	80	56	67.7	-.1	98 21	42	3	4	0	54 64	1.51	-2.17	1.14	9	5	.0	0	9.4	W	38	NW	20	11	12	7	5.1	77	
NORTH CAROLINA																															
Asheville CO	2203	945.1	1017.2	85	62	73.7	+2.4	93 20	47	3	5	0	---	---	2.40	-1.12	.85	10	10	.0	0	6.9	---	42	NW	10	8	12	10	5.4	75
Asheville	2093	945.1	1017.2	85	62	73.7	+2.4	93 20	47	3	5	0	---	---	2.40	-1.12	.85	10	10	.0	0	6.9	---	42	NW	10	8	12	10	5.4	75
Charlotte	753	989.8	1017.2	87	66	76.9	+3	94 1	53	3	9	0	66 73	4.41	+.91	1.84	9	12	.0	0	5.6	S	41	NW	10	5	14	11	6.1	73	
Greensboro	891	986.8	1018.2	86	64	74.9	+3	93 10	49	2	6	0	64 75	7.90	+.428	3.60	11	9	.0	0	6.3	SSW	40	N	9	7	12	11	6.0	62	
Hatteras	4	1016.9	1017.5	80	70	75.0	-.6	85 29	59	2	0	0	67 77	5.74	+.137	2.89	9	6	.0	0	10.4	S	29	E	17	12	7	11	5.2	69	
Raleigh CO	406	1017.7	1017.4	86	65	75.3	-1.3	94 30	50	2	8	0	---	---	4.19	-.11	1.63	8	8	.0	0	5.7	---	23	NE	1	8	15	7	5.3	71
Raleigh	438	1001.7	1017.4	86	64	74.8	-.9	94 30	48	2	11	0	66 76	3.99	-.23	1.00	9	8	.0	0	6.6	SW	---	---	---	---	---	---	---	---	---
Wilmington	30	1016.3	1016.0	86	67	76.0	-1.6	97 1	53	3	4	0	68 77	4.63	+.14	1.30	8	7	.0	0	8.7	S	38	SW	17	9	13	8	5.6	69	
Winston-Salem	967	982.7	1017.3	86	65	75.4	+5	94 30	52	2	8	0	64 72	8.53	+.93	1.85	11	8	.0	0	7.0	SW	*25	NW	10	8	11	11	5.6	60	
NORTH DAKOTA																															
Bismarck	1650	952.3	1011.7	75	54	64.4	+1	94 12	37	6	2	0	56 75	5.68	+2.35	3.07	14	9	T	0	12.1	SE	66	NW	14	5	12	13	6.5	50	
Devils Lake CO	1471	959.4	1011.6	73	52	62.7	+3	92 12	36	6	1	0	---	---	4.88	+1.70	1.44	16	9	.0	0	8.1	---	31	W	25	7	13	10	6.1	56
Fargo	895	977.7	1012.9	75	54	64.9	+3	91 11	33	6	4	0	57 76	5.23	+2.19	2.05	14	12	.0	0	12.4	NNE	57	W	14	6	11	13	6.4	56	
Williston CO	1877	945.1	1011.6	72	54	63.0	-.0	92 12	42	5	1	0	53 73	5.62	+2.03	1.12	18	12	T	0	7.7	---	35	W	24	3	14	13	7.0	58	
OHIO																															
Akron	1210	979.3	1017.3	81	57	69.1	+7	92 20	42	2	3	0	58 71	5.51	+.167	2.49	9	8	T	T	7.7	SW	---	---	---	---	---	---	---	---	---
Cincinnati Obs.	761	989.8	1017.2	87	65	76.0	+3.2	97 30	50	2	12	0	---	---	1.66	-2.39	.81	7	7	.0	0	5.0	---	20	NW	25	---	---	---	---	---
Cincinnati	553	985.1	1016.4	88	64	75.9	+4.1	98 30	46	2	12	0	61 65	3.14	-.90	1.60	5	7	T	0	8.3	SSW	---	---	---	---	---	---	---	---	---
Cleveland CO	663	989.2	1016.4	79	63	71.1	+1.8	95 20	51	2	9	0	---	---	1.97	-1.29	.75	8	5	---	---	---	---	---	---	---	---	---	---	---	---
Cleveland	787	989.2	1016.4	80	60	71.5	+2.1	95 20	43	2	9	0	57 65	3.30	+.25	1.11	8	5	.0	0	9.5	S	56	S	8	7	14	9	5.7	67	
Columbus CO	724	989.2	1016.4	84	64	74.3	+2.3	99 30	50	2	9	0	---	---	3.03	-.63	1.92	7	9	.0	0	9.3	---	---	---	---	---	---	---	---	---
Columbus	815	987.5	1016.3	86	61	73.7	+3.0	98 30	45	2	14	0	61 67	1.79	-2.54	.83	8	7	.0	0	6.9	NW	34	N	10	9	15	6	4.9	79	
Dayton	1002	980.7	1016.4	85	64	74.4	+3.5	98 30	49	2	11	0	61 66	1.71	-2.19	.94	6	4	.0	0	7.2	SE	34	NW	25	5	15	10	5.7	80	
Sandusky CO	603	993.9	1016.4	82	64	72.8	+2.9	98 20	53	2	8	0	---	---	3.83	+.10	1.18	8	7	T	0	7.1	---	36	W	25	8	16	6	5.0	74
Toledo	621	993.2	1016.1	84	60	71.9	+3.3	98 20	49	2	9	0	59 67	2.57	-.98	1.09	10	7	.0	0	9.9	SSW	44	NW	25	6	16	8	5.9	75	
Youngstown	1178	974.9	1017.1	80	56	68.2	+2	92 20	44	2	3	0	57 70																		



## CLIMATOLOGICAL DATA

Table 2-Continued

JUNE 1953

State and station	Elevation (ground)	Pressure			Temperature										Precipitation						Wind			No. of days		Possible sunshine							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	
												Max 90° F. or above	Min 32° F. or below						0.1 inch or more	With thunderstorms	Total	Max depth on ground											
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	%	In.	In.	In.			In.	In.	p. h.	M.	M.									
TENNESSEE (Cont.)																																	
Chattanooga	670	989.5	1016.1	92	67	79.7	+3.9	100	21	53	3	21	0	67	70	1.99	-2.22	0.83	6	7	0.0	0	4.7	S	67	NW	13	10	14	8	4.8	79	
Knoxville	949	982.4	1016.9	90	66	78.0	+2.9	99	21	55	3	14	0	66	69	3.02	-.45	1.04	9	7	0.0	0	6.4	NE	57	N	10	13	10	7	4.5	69	
Memphis CO	271	-----	-----	95	76	85.4	+6.7	100	18	65	2	27	0	-----	-----	.71	-2.54	.71	1	-----	0.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Memphis	263	1000.3	1014.4	97	74	85.6	+7.3	103	11	62	3	28	0	69	60	.04	-3.29	.03	2	1	0.0	0	8.7	S	43	N	26	15	10	5	4.3	88	
Nashville	577	996.6	1015.9	93	69	81.0	+4.1	101	20	57	3	21	0	68	68	1.90	-1.29	.53	10	9	0.0	0	5.0	SSE	73	NW	13	11	11	8	4.8	74	
Oak Ridge	905	984.4	-----	89	66	77.6	+3.4	97	21	52	3	15	0	-----	-----	2.91	-1.09	.72	10	11	0.0	0	4.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	
TEXAS																																	
Abilene	1752	951.2	1010.0	100	75	87.7	+7.9	105	20	67	2	29	0	59	43	2.41	-.38	2.35	3	0	0.0	0	15.8	SSE	40	S	19	22	5	3	2.3	84	
Amarillo	3590	887.2	1008.0	99	68	83.3	+9.7	108	24	52	5	29	0	50	36	.01	-3.24	.01	1	6	0.0	0	13.8	S	65	S	17	8	5	3.5	83		
Austin	615	992.2	1013.4	97	73	84.8	+3.3	103	12	64	4	29	0	68	64	1.59	-1.61	1.24	2	2	0.0	0	9.9	S	45	E	12	22	7	1	2.4	87	
Big Spring	2569	923.8	1009.3	99	75	86.8	+6.3	105	25	65	4	30	0	55	38	.21	-1.50	.19	2	2	0.0	0	15.3	S	45	ENE	25	21	6	3	2.5	87	
Brownsville	16	1009.8	1012.1	94	77	85.7	+3.1	97	28	68	2	30	0	74	71	.01	-3.35	.01	1	0	0.0	0	13.7	SE	33	SE	4	16	14	0	3.8	87	
Corpus Christi	40	1011.9	1013.8	95	76	85.8	+4.8	100	12	67	2	30	0	74	72	.25	-2.63	.22	3	0	0.0	0	12.5	SE	27	SE	4	19	10	1	3.1	94	
Dallas	487	994.6	1012.9	99	77	87.6	+5.7	105	12	68	2	29	0	68	55	.83	-2.62	.80	2	1	0.0	0	12.2	S	35	S	4	25	3	2	2.1	87	
Del Rio	1091	977.0	1010.2	101	77	89.4	+6.7	106	22	69	2	29	0	72	46	.02	-2.40	.02	1	1	0.0	0	10.9	ESE	34	SE	9	16	10	4	3.1	78	
El Paso	3920	879.1	1007.3	98	70	84.1	+3.9	106	23	60	20	27	0	38	22	.53	-.09	.28	3	4	0.0	0	10.7	S	37	S	10	20	6	4	2.5	92	
Fort Worth	544	991.9	1012.5	99	77	87.5	-----	105	21	69	2	29	0	66	52	.55	-2.80	.54	2	0	0.0	0	12.7	S	30	S	4	25	3	2	1.8	92	
Galveston CO	7	-----	-----	89	80	84.1	+2.6	94	2	72	29	16	0	-----	-----	4.05	+.70	3.89	5	-----	0.0	0	11.6	-----	42	SE	29	-----	-----	-----	-----	90	
Galveston	5	1013.5	1014.1	89	79	84.2	+2.4	93	2	73	29	16	0	76	76	1.51	-1.84	1.04	6	6	0.0	0	11.8	S	-----	-----	-----	-----	-----	-----	-----	-----	
Houston CO	41	1008.8	-----	94	76	84.8	+3.0	98	21	70	13	29	0	-----	-----	2.44	-1.64	2.35	4	4	0.0	0	9.2	-----	28	E	12	14	2	3.4	92		
Houston	50	1010.8	1013.5	94	74	83.9	+3.4	99	22	68	13	29	0	72	71	3.49	-.20	2.84	4	4	0.0	0	11.7	SE	-----	-----	-----	-----	-----	-----	-----	-----	
Laredo	500	995.6	1010.5	102	78	89.9	+4.1	107	19	71	12	30	0	70	69	.66	-.43	.58	2	0	0.0	0	17.1	SE	-----	-----	-----	-----	-----	-----	-----	-----	
Lubbock	3243	900.8	1008.6	98	68	83.1	+6.7	105	24	59	20	30	0	53	40	.45	-2.08	.42	2	2	0.0	0	15.7	S	40	S	3	21	7	2	2.7	87	
Port Arthur	15	1013.2	1014.1	93	74	83.6	+3.5	97	21	69	12	28	0	75	77	1.73	-3.05	1.41	6	5	0.0	0	9.7	S	47	SE	29	20	8	2	3.4	85	
San Angelo	1903	945.1	1010.2	98	75	86.5	+5.9	104	25	68	1	30	0	59	42	.65	-1.17	.60	2	1	0.0	0	9.9	SE	59	E	12	11	8	1	2.9	81	
San Antonio	782	988.2	1012.4	97	73	85.0	+3.0	101	19	62	2	29	0	67	60	2.19	-1.01	1.98	4	2	0.0	0	7.8	-----	40	E	12	17	12	1	3.4	81	
Victoria	109	1008.1	1008.6	96	74	85.0	+1.9	101	27	67	2	29	0	70	65	.80	-2.44	.50	3	4	0.0	0	7.8	-----	40	E	12	17	12	1	3.4	81	
Waco	504	994.2	1013.3	97	74	85.6	+3.8	102	22	67	1	29	0	69	62	.27	-2.92	.15	2	0	0.0	0	11.0	S	-----	-----	-----	-----	-----	-----	-----	-----	
Wichita Falls	1027	974.9	1010.2	101	77	88.8	+9.2	109	14	63	6	28	0	62	44	2.88	-.52	1.46	4	2	0.0	0	13.0	S	37	NW	19	23	5	2	1.9	87	
UTAH																																	
Millford	5028	843.9	1010.3	86	46	65.9	+1	97	22	33	2	12	0	-----	-----	.06	-.39	.05	2	0	0.0	0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Salt Lake City	4222	864.9	1009.6	81	52	66.7	-.4	99	30	40	25	7	0	39	41	.51	-.40	.34	5	3	0.0	0	11.2	SE	37	W	5	20	6	4	2.9	83	
VERMONT																																	
Burlington	331	1000.0	1014.2	79	55	67.2	+1.7	95	21	35	3	3	0	52	61	2.67	-.90	1.27	6	5	0.0	0	8.6	S	32	S	25	10	8	12	5.5	68	
VIRGINIA																																	
Cape Henry CO	16	1016.3	1016.9	81	67	73.6	-.6	92	6	57	2	2	0	-----	-----	3.44	-.61	1.32	10	4	0.0	0	10.4	-----	40	N	22	14	7	9	4.5	78	
Lynchburg	947	1014.9	1017.6	84	63	73.8	-.6	92	30	48	2	7	0	63	74	4.78	-.90	1.56	10	9	0.0	0	7.2	SSW	36	NW	9	6	12	12	5.9	63	
Norfolk CO	11	1014.6	1017.8	83	66	74.9	-.1	94	23	55	2	6	0	-----	-----	5.49	+.13	2.72	9	8	0.0	0	8.9	-----	29	E	27	-----	-----	-----	-----	76	
Norfolk	25	1016.6	1017.8	83	65	73.9	-.8	91	23	53	2	4	0	64	73	2.92	-1.24	1.30	8	6	0.0	0	8.7	SW	-----	-----	-----	-----	-----	-----	-----	-----	
Richmond CO	162	-----	-----	85	65	75.2	+.5	94	23	50	2	10	0	-----	-----	2.50	-1.28	1.07	9	-----	0.0	0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Richmond	160	1011.2	1017.2	86	64	75.2	+.9	95	23	48	2	13	0	64	73	3.06	-.81	1.43	11	10	0.0	0	7.2	S	34	NW	9	10	9	11	5.5	66	
Rossmore	1174	976.0	1017.4	87	62	74.6	+1.9	96	30	46	2	13	0	62	71	5.34	-.64	2.07	12	9	0.0	0	5.6	SE	-----	-----	-----	-----	-----	-----	-----	-----	
Washington CO	72	-----	-----	85	66	75.4	+1.5	94	21	52	1	11	0	-----	-----	2.66	-.76	1.63	8	5	0.0	0	6.3	-----	33	W	6	-----	-----	-----	-----	-----	
Wash. Nat'l AP	14	1012.5	1016.9	84	66	74.6	+1.2	93	6	53	2	10	0	62	68	2.98	-.43	1.28	6	5	0.0	0	9.0	S	35	NW	6	8	12	10	5.4	64	
WASHINGTON																																	
Ellensburg	1727	953.6	1015.7	68	45	56.8	-5.6	79	11	35	5	0	0	42	61	.62	-.08	.49	4	1	0.0	0	17.5	NW	45	NW	17	9	11	10	5.4	87	
Kelso	17	-----	-----	66	47	56.7	-2.6	80	11	37	5	0	0	-----	-----	3.19	+1.44	.69	16	0	0.0	0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Olympia	190	1010.8	1018.4	67	46	56.1	-2.8	79	16	40	3	0	0	45	72	1.50	+.22	.49	14	1	0.0	0	4.6	SSW	18	W	23	2	4	24	8.4	87	
Seattle CO	14	-----	-----	65	52	58.5	-3.3	74	29	48	5	0	0	-----	-----	1.44	+.19	.78	12	0	0.0	0	8.3	-----	28	S	13	2	5	23	8.4	36	
Seattle	14	1016.9	1018.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	47	69	1.05	-.36	-----	-----	0.0	0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Spokane	2357	946.5	1015.3	68	47	57.2	-4.2	81	11	39	18	0	0	44	64	.81	-.36	.37	10	0	0.0	0	7.8	S	28	S	29	3	9	18	7.5	54	
Spokane-Tacoma	379	1004.1	1018.7	63	48	55.5	-4.4	71	10	41	5	0	0	47	79	1.85	+.55	.87	15	1	0.0	0	8.1	SW	-----	-----	-----	-----	-----	-----	-----		



## CLIMATOLOGICAL DATA

Table 2—Continued

JUNE 1953

State and station	Elevation (ground)	Pressure					Temperature										Precipitation							Wind				No. of days				
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		to sunset					
												Max. 90° F. or above	Min. 32° F. or below						With thunderstorms	Total	Max. depth on ground	Speed			Direction	Date		Clear	Partly cloudy	Cloudy		
																															Sky cover, tenths (sunrise to sunset)	Possible sunshine
ALASKA																																
Anchorage	134	1010.8	1015.9	69	49	59.1	+5.4	86	25	40	13	13	0	46	63	0.57	-0.32	0.24	7	1	0.0	0	5.6	NW	29	N	30	4	12	14	7.0	68
Annette Island	110	1012.9	1017.1	60	48	53.9	-.9	71	7	44	18	1	0	48	81	2.27	-2.45	.67	16	0	0	8.2	SSE	*30	SSE	29	0	6	24	8.8	--	
Barrow	22	1016.6	1017.4	39	30	34.5	+6	51	26	26	9	0	27	33	95	.10	-.18	.05	5	0	.1	2	11.9	WSW	29	N	25	0	9	21	8.4	--
Bethel	21	1016.9	1018.3	64	45	54.3	+1.7	84	26	35	1	7	0	47	77	.37	-.83	.14	5	0	0	10.2	NNW	*21	S	11	3	5	22	7.9	--	
Cordova	40	1014.2	1016.1	61	44	52.6	+2.5	75	2	35	6	5	0	47	79	1.44	-3.42	.40	7	0	0	3.2	SW	*18	ESE	10	3	5	22	8.0	--	
Fairbanks	436	997.3	1014.3	73	51	61.8	+3.8	85	3	40	14	19	0	48	62	1.85	+4.2	1.08	7	2	7	6.1	W	29	W	28	1	13	16	7.6	--	
Gambell	25	1016.6	1017.7	46	36	40.5	+2.6	54	2	30	4	0	7	36	85	.42	-.09	.18	5	0	7	11.9	SW	*36	ESE	1	2	5	23	8.5	--	
Juneau	15	1014.2	1015.2	66	46	56.3	+2.7	81	26	39	18	12	0	47	73	2.98	-.20	1.92	11	1	0	7.5	N	26	E	2	4	22	8.0	50		
Kotzebue	10	1015.9	1016.7	49	37	43.4	+1.1	63	15	29	8	0	5	40	90	1.32	+8.0	.80	6	0	0	13.4	WSW	*30	WSW	5	1	12	17	7.5	--	
McGrath	334	1004.4	1016.7	68	47	57.5	+1.7	81	3	37	16	11	0	46	68	1.12	-1.00	.68	10	0	0	6.4	WSW	*30	S	4	4	6	20	7.9	--	
Nome	13	1016.9	1017.6	52	40	46.0	+4	70	4	33	19	1	0	41	82	3.04	+1.96	2.03	9	0	0	8.6	WSW	26	W	25	1	11	18	7.9	37	
Northway	1713	951.6	1014.4	68	47	57.5	+1.6	78	3	39	15	12	0	46	68	4.00	+2.18	1.05	15	10	0	8.3	NW	*23	NW	22	0	3	27	8.5	--	
St. Paul Island	22	1016.9	1018.2	47	38	42.2	+7	57	25	27	8	0	2	41	92	.44	-.87	.16	5	0	0	---	---	---	---	---	---	---	---	---	---	---
Yakutat	28	1015.2	1016.6	59	44	51.1	+1.0	78	26	34	1	3	0	47	85	3.79	-1.03	2.07	9	0	0	8.3	W	*25	ESK	2	3	6	21	8.0	--	

Data from airport unless otherwise specified. CO indicates data from city office.

\* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

° Other dates also.

† Peak gust.

# Max. 70°F. or above for Alaskan stations.

## HEATING DEGREE DAYS

Table 3

(Base 65°F.)

JUNE 1953

State and station	Current season			Normals	July through this month	State and station	Current season			Normals	July through this month	State and station	Current season			Normals	July through this month	State and station	Current season			Normals	July through this month
	This month	Period July through this month	Period July through this month				This month	Period July through this month	Period July through this month				This month	Period July through this month	Period July through this month				This month	Period July through this month	Period July through this month		
ALABAMA						INDIANA (Cont'd.)						NEVADA						SOUTH DAKOTA (Cont'd.)					
Birmingham	0	2609	2780			Ft. Wayne	5	5888	6287			Elko	210	6918	7335			Pierre	40	7372			
Mobile	0	1535	1612			Indianapolis (CO)	0	4847	5134			Ely	225	7538	7443			Rapid City	68	6809	7535		
Montgomery (CO)	0	1884	1954			Indianapolis	1	5233	5611			Las Vegas	0	2383	2425			Sioux Falls	41	7637	7848		
Montgomery	0	2126	2137			South Bend	18	6099	6524			Reno	235	5986	6036			TENNESSEE					
ARIZONA						Terre Haute	2	5082	5366			Tonopah	98	5813	5813			Bristol	0	4083	4144		
Flagstaff	185	7191	7525			IOWA						Winnemucca	216	6387	6369			Chattanooga	0	3258	3384		
Phoenix (CO)	0	1286	1492			Burlington	1	5924	6101			NEW HAMPSHIRE						Knoxville	0	3447	3590		
Phoenix	0	1507	1698			Charles City (CO)	24	7314	7504			Concord	86	6688	7612			Memphis	0	3054	3137		
Prescott	26	4370	4533			Des Moines	8	6401	6446			Mt. Washington	588	13222				Nashville	0	3432	3513		
Tucson	0	1685	1776			Dubuque	21	7098	7271			NEW JERSEY						TEXAS					
Winslow	7	4692	4702			Keokuk (CO)	0	5266				Atlantic City (CO)	24	4143	4741			Abilene	0	2286	2657		
Yuma	0	840	951			Sioux City	14	6987	7012			Newark	15	4637	5252			Amarillo	0	3941	4345		
ARKANSAS						KANSAS						Trenton (CO)	25	4551	5068			Austin	0	1543	1713		
Ft. Smith	0	3361	3188			Concordia (CO)	6	5262	5323			NEW MEXICO						Big Spring	0	2331	2480		
Little Rock	0	2929	2982			Dodge City	5	4820	5058			Albuquerque	0	4282	4389			Brownsville	0	445	617		
Texarkana	0	2438	2362			Goodland	17	6103	6367			Clayton	2	5092	5138			Corpus Christi	0	776	1011		
CALIFORNIA						Topeka (CO)	0	4848	4919			Raton	16	6302	6417			Dallas	0	2191	2272		
Bakersfield	6	2118	2115			Topeka	0	5053	5209			Roswell	0	3336	3424			Del Rio	0	1249	1407		
Beaumont (CO)	77	3044	2840			Wichita	0	4474	4571			NEW YORK						El Paso	0	2410	2641		
Bishop	41	4221	4222			KENTUCKY						Albany	47	6268	6962			Ft. Worth	0	2111	2361		
Blue Canyon	343	5849	5719			Lexington	1	4375	4979			Binghamton	97	6882	7537			Galveston (CO)	0	1047	1233		
Burbank	35	1742	1808			Louisville (CO)	0	3890	4279			Buffalo	44	6151	6838			Galveston	0	1137	1276		
Eureka (CO)	319	4790	4632			Louisville	0	4128	4439			New York (CO)	17	4463	5050			Houston (CO)	0	2332	1388		
Fresno	22	2543	2532			Pikeville (CO)	4	3483				La Guardia Field	11	4281	4989			Laredo	0	724	781		
Los Angeles (CO)	26	1314	1451			LOUISIANA						Rochester	51	6102	6863			Lubbock	0	3437	3587		
Los Angeles	36	1671	2015			Baton Rouge	0	1457	1595			Schenectady	25	5969				Port Arthur	0	1348	1517		
Mt. Shasta (CO)	290	5839	5913			Lake Charles	0	1337	1543			Syracuse	55	6096	6520			San Angelo	0	1986	2107		
Oakland	130	2913	3163			New Orleans (CO)	0	1001	1175			NORTH CAROLINA						San Antonio	0	1397	1579		
Red Bluff	22	2552	2546			New Orleans	0	1113				Asheville (CO)	0	3913	4072			Victoria	0	1064	1126		
Sacramento (CO)	33	2428	2600			Int. Airport, Moisant	0	1237	1317			Asheville	5	4245				Wichita Falls	0	906	2025		
Sacramento	43	2682	2822			Shreveport	0	2070	2117			Charlotte	0	2993	3205			UTAH					
Sandberg (CO)	213	4570	4243			MAINE						Cheneseboro	1	3583	3810			Milford	54	6056	6445		
San Diego	27	1349	1574			Caribou	178	9098	10173			Hatteras (CO)	0	2151	2392			Salt Lake City (CO)	45	4950	5463		
San Francisco (CO)	212	3242	3069			Eastport (CO)	238	7338	8246			Raleigh (CO)	0	2897	3075			Salt Lake City	64	5405	5866		
San Francisco	189	3383	3421			Greenville (CO)	148	8729				Raleigh	2	3166	3369			VERMONT					
San Jose	95	2432	2410			Portland	129	6860	7681			Wilmington	0	2236	2323			Burlington	64	6899	7865		
Santa Maria	210	3102	2934			MARYLAND						Winston-Salem	2	3315	3721			VIRGINIA					
COLORADO						Baltimore (CO)	15	3748	4203			NORTH DAKOTA						Cape Henry (CO)	3	2949	3307		
Alamosa	97	8656	8659			Baltimore	14	4238	4611			Bismarck	104	8464	9033			Lynchburg	3	3835	4153		
Colorado Springs	41	6321	6254			Frederick	30	4924	4854			Devils Lake (CO)	133	9286	9940			Norfolk (CO)	1	2722	3119		
Denver	30	5793	6132			MASSACHUSETTS						Fargo	102	8819	9274			Norfolk	0	3057	3454		
Grand Junction	7	5534	5796			Boston	32	5213	5791			Grand Forks	110	9203				Norfolk (CO)	4	3400	3720		
Pueblo	5	5386	5709			Milton	86	6049			Pembina	105	9212				Richmond (CO)	6	3622	3955			
CONNECTICUT						Nantucket	93	5441	6102			Williston (CO)	134	8460	9068			Rosnoke	4	3856	4152		
Bridgeport	29	5029	5896			Pittsfield	116	6976	7694			OHIO						WASHINGTON					
Hartford	34	5438	6139			MICHIGAN						Akron	29	5966	6203			Ellensburg	236	6272	6542		
New Haven	49	5308	6026			Alpena (CO)	118	7426	8073			Cincinnati (CO)	0	4080	4532			Kelso	243	4995	5239		
DELAWARE						Detroit	15	5861	6404			Cincinnati	1	4780	5195			Olympia	264	5417	5501		
Wilmington	18	4533	4910			Escanaba (CO)	116	7970	8657			Cleveland (CO)	19	5198	5717			Seattle (CO)	187	4173	4438		
DIST. OF COLUMBIA						Grand Rapids (CO)	11	6077	6474			Cleveland	10	5454	6006			Seattle	278	5306	5275		
Washington (CO)	13	3755	4258			Grand Rapids	16	6480	7075			Columbus	9	5146	5615			Spokane	231	6136	6852		
Washington	12	3832	4333			Lansing	19	6512	6982			Dayton	3	5277	5597			Tatoosh Island (CO)	362	5638	5724		
FLORIDA						Marquette (CO)	149	8057	8529			Sandusky (CO)	6	5300	5858			Walla Walla (CO)	85	4220	4848		
Apalachicola (CO)	0	1130	1307			Muskegon	32	6594	7089			Toledo	13	5805	6394			Yakima	186	5538	5845		
Daytona Beach	0	757	868			Sault Ste. Marie	218	8533	9475			Youngstown	37	5961	6172			WEST VIRGINIA					
Fort Myers	0	289	405			Ypsilanti	8	5955				OKLAHOMA						Charleston	4	4099	4417		
Jacksonville (CO)	0	911	1113			MINNESOTA						Oklahoma City (CO)	0	3403	3519			Elkins	30	4488	5773		
Jacksonville	0	1083	1243			Duluth (CO)	214	9405	9574			Oklahoma City	0	3478	3644			Huntington (CO)	0	3903	4073		
Key West (CO)	0	40	77			Duluth	176	9503	9981			Tulsa	0	3536	3584			Parkersburg (CO)	3	4406	4750		
Key West	0	56	89			International Falls	167	10228	10600			OREGON						Petersburg (CO)	18	4530	4966		
Melbourne	0	481	573			Minneapolis	37	7788	7853			Burns (CO)	302	6761	6918			WISCONSIN					
Miami (CO)	0	151	173			Rochester	44	8049	8095			Eugene	211	4723	4779			Green Bay	50	7850	8259		
Int. Airport, Hialeah	0	108	178			St. Cloud	75	8626	8893			Medford	477	7408	7888			La Crosse	26	7396	7650		
Miami Beach	0	91	123			MISSISSIPPI						Medford	158	4683	4547			Madison (CO)	18	6895	7300		
Orlando	0	585	650			Jackson	0	2096	2202			Pendleton	187	4899	5204			Madison	18	7021	7417		
Pensacola (CO)	0	1275	1435			Meridian	0	2265	2333			Portland (CO)	166	3930	4143			Madison (CO)	54	6493	6944		
Tallahassee	0	1302	1519			Vicksburg (CO)	0	1910	2000			Portland	186	4407	4632			Milwaukee (CO)	57	6739	7205		
Tampa	0	525	674			MISSOURI						Roseburg	230	4578				Milwaukee	57	6739	7205		
West Palm Beach	0	189	248			Columbia	0	4792	5113			Salem	215	4700	4574			WYOMING					
GEORGIA						Kansas City	0	4673	4888			Sexton Summit (CO)	469	6306	6217			Casper	86	6851	7638		
Albany	0	1668	1763			St. Joseph	1	5364	5336			PENNSYLVANIA						Cheyenne	111	7169	7562		
Athens	0	2847	2800			St. Louis (CO)	0	4193	4469			Allentown	30	5349	5880			Lander	129	7583	8303		
Atlanta (CO)	0	2740	2811			Springfield	0	4502	4693			Erie (CO)	32	5472	6116			Rock Springs (CO)	117	7501			
Atlanta	0	2756	2826			MONTANA						Harrisburg	19	4799	5258			Rock Springs	138	7947	8473		
Augusta	0	2385	2138			Billings	125	6400	7106			Park Place (CO)	68	6401	7175			Sheridan	127	7010	7903		
Columbus	0	2382	2396			Glasgow (CO)	94	8234	8690			Philadelphia (CO)	16	4093	4523			ALASKA					

Data from airport unless otherwise specified. CO indicates data from city office.



# MONTHLY AND SEASONAL HEATING DEGREE DAYS

1952 - 1953

Table 3A

State and Station	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total for Season	Normals July-June
<b>ALABAMA</b>														
Birmingham	0	0	1	267	393	613	478	441	236	173	7	0	2609	2780
Mobile (CO)	0	0	0	116	257	386	307	283	62	61				
Mobile	0	0	0	116	256	402	318	304	70	69	0	0	1535	1612
Montgomery (CO)	0	0	0	138	284	510	380	341	134	95	2	0	1884	1954
Montgomery	0	0	0	170	335	539	427	374	158	120	3	0	2126	2137
<b>ARIZONA</b>														
Flagstaff	65	42	199	424	1023	1190	922	958	886	683	614	185	7191	7525
Phoenix (CO)	0	0	0	0	236	378	259	267	102	39	5	0	1286	1492
Phoenix	0	0	0	0	252	429	318	322	131	49	6	0	1507	1698
Prescott	0	0	20	98	699	851	655	719	582	403	317	26	4370	4533
Tucson	0	0	0	0	275	456	339	352	161	64	38	0	1685	1776
Winslow	0	0	13	134	883	974	768	778	560	325	250	7	4692	4702
Yuma	0	0	0	0	168	294	119	171	69	19	0	0	840	951
<b>ARKANSAS</b>														
Ft. Smith	0	0	3	274	506	745	677	554	295	255	52	0	3361	3188
Little Rock	0	0	2	264	448	645	555	508	254	213	40	0	2929	2982
Texarkana	0	0	0	201	396	595	480	435	164	137	30	0	2438	2362
<b>CALIFORNIA</b>														
Bakersfield	0	0	7	4	328	481	406	391	273	149	73	6	2118	2115
Beaumont (CO)	0	0	15	19	448	552	374	485	439	365	270	77	3044	2840
Bishop	0	0	28	140	685	868	661	634	538	333	293	41	4221	4282
Blue Canyon	3	5	125	168	676	919	719	730	815	675	671	343	5849	5719
Burbank	0	0	5	29	274	352	222	243	256	221	105	35	1742	1806
Eureka (CO)	296	276	273	322	456	513	425	492	544	480	394	319	4790	4632
Fresno	0	0	16	18	366	554	441	459	355	185	127	22	2543	2532
Los Angeles (CO)	0	0	0	13	201	281	157	180	194	180	82	26	1314	1451
Los Angeles	30	0	14	55	216	299	199	211	262	227	122	36	1671	2015
Mt. Shasta (CO)	7	17	88	231	770	1009	808	717	764	586	290	552	5913	5913
Oakland	36	71	25	146	354	460	376	391	383	314	227	130	2913	3163
Red Bluff	0	0	7	13	370	613	447	379	348	225	128	22	2552	2546
Sacramento (CO)	0	0	9	23	375	537	404	367	334	203	143	33	2428	2600
Sacramento	0	0	11	53	431	553	431	398	377	226	159	43	2682	2822
Sandberg (CO)	0	0	28	34	618	806	590	632	627	500	502	213	4570	4243
San Diego	1	0	1	21	171	259	156	223	224	172	94	27	1349	1574
San Francisco (CO)	195	218	128	200	271	408	324	300	361	364	265	212	3242	3069
San Francisco	85	148	83	187	382	447	361	414	431	367	289	189	3383	3421
San Jose	3	8	17	78	315	428	349	353	340	256	190	95	2432	2410
Santa Catalina	8	22	26	85	290	389	234	256	360	387	261			
Santa Maria	97	101	88	199	321	431	279	344	392	366	274	210	3102	2934
<b>COLORADO</b>														
Alamosa	31	54	274	626	1197	1679	1247	1165	968	760	558	97	8656	8659
Colorado Springs	23	7	120	414	999	1052	814	961	744	687	429	41	6321	6240
Denver	23	0	68	354	971	1000	781	897	656	660	353	30	5793	6132
Grand Junction	0	0	14	231	867	1142	970	887	674	466	276	7	5534	5796
Pueblo	10	0	53	354	930	1023	780	847	621	489	274	5	5386	5709
<b>CONNECTICUT</b>														
Bridgeport	0	2	41	377	585	898	922	803	759	454	169	29	5029	5896
Hartford	0	7	73	432	671	955	1009	850	776	467	164	34	5438	6139
New Haven	0	5	68	411	607	912	952	824	796	488	196	49	5308	6026
<b>DELAWARE</b>														
Wilmington	0	4	32	391	579	848	846	740	631	377	67	18	4533	4910
<b>DISTRICT OF COLUMBIA</b>														
Washington (CO)	0	0	14	295	478	783	724	617	539	276	16	13	3755	4258
Washington	0	0	19	304	499	803	747	621	537	275	15	12	3832	4333
<b>FLORIDA</b>														
Apalachicola (CO)	0	0	0	55	167	323	275	206	61	43	0	0	1130	1307
Daytona Beach	0	0	0	17	91	256	223	122	20	28	0	0	757	868
Fort Myers	0	0	0	5	19	123	98	40	3	1	0	0	289	405
Jacksonville (CO)	0	0	0	49	116	293	227	153	44	29	0	0	911	1113
Jacksonville	0	0	0	48	139	356	264	180	56	40	0	0	1083	1243
Key West (CO)	0	0	0	0	0	22	0	4	0	0	0	0	47	77
Key West	0	0	0	0	0	28	23	5	0	0	0	0	56	89
Melbourne	0	0	0	9	37	180	159	67	14	15	0	0	481	537
Miami (CO)	0	0	0	0	11	58	61	13	8	0	0	0	151	173
Miami Int. Airport,														
Hialeah	0	0	0	0	8	49	45	4	2	0	0	0	108	178
Miami Beach	0	0	0	0	4	38	42	6	1	0	0	0	91	123
Orlando	0	0	0	0	54	209	184	91	17	0	0	0	580	650
Pensacola (CO)	0	0	0	81	205	342	277	242	67	61	0	0	1277	1435
Tallahassee	0	0	0	62	195	384	306	228	62	65	0	0	1302	1519
Tampa	0	0	0	14	47	209	153	75	16	11	0	0	525	674
West Palm Beach	0	0	0	0	15	77	79	14	3	1	0	0	189	248
<b>GEORGIA</b>														
Albany	0	0	0	104	253	481	352	304	100	74	0	0	1668	1763
Athens	0	0	0	219	386	655	557	497	344	183	8	0	2847	2800
Atlanta (CO)	0	0	2	207	359	667	523	465	317	192	8	0	2740	2811
Atlanta	0	0	0	202	359	655	548	486	319	180	7	0	2756	2826
Augusta	0	0	0	199	331	593	457	407	254	144	0	0	2385	2138
Columbus	0	0	0	180	338	593	470	423	216	162	0	0	2382	2396
Macon	0	0	0	150	283	564	435	386	201	114	1	0	2139	2049
Rome	0	0	1	306	476	726	594	522	360	228	16	0	3229	3138
Savannah	0	0	0	115	230	500	355	300	135	87	0	0	1722	1710
Valdosta	0	0	0	82	204	421	301	258	76	59	0	0	1401	1525
<b>IDAHO</b>														
Boise	13	8	63	247	894	951	737	796	695	561	395	170	5530	5890
Lewiston	8	8	53	273	881	886	637	700	644	439	310	152	4991	5483
Pocatello	12	3	85	387	1121	1176	885	879	815	649	494	168	6674	6976
<b>ILLINOIS</b>														
Cairo (CO)	0	0	4	310	484	738	735	593	382	298	48	0	3592	3756
Chicago (CO)	0	3	56	434	605	945	1061	783	783	564	225	29	5488	6087
Chicago	0	6	85	502	660	1005	1098	924	789	544	187	15	5815	6310
Chicago University	0	5	69	464	632	974	1084	788	788	572	230	35	5641	
Joliet	0	12	112	601	723	1059	1168	975						
Moline	0	9	97	565	702	1062	1224	974	850	570	204	2	6259	6364
Peoria	0	2	80	514	670	1005	1125	896	773	533	172	0	5770	6087
Springfield (CO)	0	0	32	386	582	912	993	775	644	442	99	0	4865	5225
Springfield	0	1	68	479	637	944	1024	815	696	483	123	0	5270	5693
<b>INDIANA</b>														
Evansville	0	0	39	408	564	811	837	682	525	376	53	0	4295	4360
Ft. Wayne	3	14	109	553	706	987	1073	919	805	581	133	5	5888	6

# MONTHLY AND SEASONAL HEATING DEGREE DAYS

1952 - 1953

Table 3A-Continued

State and Station	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total for Season	Normals July-June
IOWA														
Burlington	0	5	81	501	685	1037	1162	895	1008	546	203	1	5924	6101
Charles City (CO)	1	16	141	623	849	1258	1382	1157	946	701	216	24	7314	7504
Davenport (CO)	0	4	59	473	663	1028	1193	941	826	559				
Des Moines	0	4	77	497	776	1162	1260	985	828	601	203	8	6401	6446
Dubuque	0	22	153	629	801	1186	1311	1100	955	659	261	21	7098	7271
Keokuk (CO)	0	0	26	426	630	959	1067	819	737	484	118	0	5266	
Sioux City	2	0	84	530	855	1285	1413	1105	856	634	209	14	6987	7012
KANSAS														
Concordia (CO)	0	0	29	344	732	1118	1017	731	605	486	194	6	5262	5323
Dodge City	1	0	25	307	729	1060	797	725	529	441	201	5	4820	5058
Goodland	14	9	67	436	932	1201	876	913	696	644	298	17	6103	6367
Topeka (CO)	0	0	25	321	662	1010	954	685	585	443	163	0	4848	4919
Topeka	0	0	33	378	695	1038	959	702	621	463	164	0	5053	5209
Wichita	0	0	15	276	643	984	846	670	481	403	156	0	4474	4571
KENTUCKY														
Lexington	0	1	35	435	566	819	777	713	562	425	41	1	4375	4979
Louisville (CO)	0	0	15	356	502	767	756	633	492	338	31	0	3890	4279
Louisville	0	0	31	411	538	791	764	664	529	366	34	0	4128	4439
Pikeville (CO)	0	0	4	346	423	769	652	590	413	269	13	1	3483	
LOUISIANA														
Baton Rouge	0	0	0	132	263	381	293	281	53	54	0	0	1457	1595
Lake Charles	0	0	0	102	241	364	279	281	30	40	0	0	1337	1543
New Orleans (CO)	0	0	0	68	174	278	209	222	22	28	0	0	1001	1175
New Orleans	0	0	0	78	195	296	249	232	31	32	0	0	1113	
New Orleans Int'l.														
Moisant	0	0	0	96	237	336	252	241	34	41	0	0	1237	1317
Shreveport	0	0	0	184	342	519	416	394	110	89	16	0	2070	2117
MAINE														
Caribou	20	89	313	782	1048	1422	1520	1327	1227	747	425	178	9098	10173
Eastport (CO)	56	94	221	534	772	1082	1124	1045	1006	636	530	238	7338	8246
Greenville (CO)	18	93	293	729	950	1325	1466	1399	1172	766	370	148	8729	
Portland	6	24	185	564	813	1073	1124	1041	940	620	341	129	6860	7681
MARYLAND														
Baltimore (CO)	0	0	8	264	457	747	714	636	558	311	38	15	3748	4203
Baltimore	0	1	27	366	553	833	793	692	597	327	35	14	4238	4611
Frederick	0	7	68	455	633	920	888	751	685	422	65	30	4924	4854
MASSACHUSETTS														
Boston	0	2	62	368	595	901	930	834	799	475	215	32	5213	5791
Milton (Blue Hill Obs.)	0	17	96	452	683	1010	1027	945	886	574	273	86	6049	
Nantucket	1	9	113	349	571	858	878	819	833	572	345	93	5441	6102
Pittsfield	11	48	192	629	799	1124	1145	1059	952	635	269	116	6976	7694
MICHIGAN														
Alpena (CO)	30	45	183	634	797	1044	1219	1111	1066	776	403	118	7426	8073
Detroit	2	11	95	521	660	953	1062	913	834	607	188	15	5861	6404
Escanaba (CO)	45	76	243	694	828	1102	1303	1239	1086	793	445	116	7970	8657
Grand Rapids (CO)	8	13	107	555	681	980	1115	950	856	615	186	11	6077	6474
Grand Rapids	10	16	127	626	748	1037	1157	983	888	658	214	16	6480	7075
Lansing	8	22	156	628	736	1028	1179	987	891	663	195	19	6512	6982
Marquette (CO)	48	91	215	680	840	1116	1318	1214	1066	859	461	149	8057	8529
Muskegon	17	21	133	609	718	1044	1155	999	909	681	276	32	6594	7089
Sault Ste. Marie	19	98	249	754	904	1157	1424	1270	1164	841	435	218	8533	9475
Ypsilanti	0	7	103	546	685	975	1089	940	833	616	153	8	5955	
MINNESOTA														
Duluth (CO)	44	113	281	776	1032	1318	1622	1438	1184	867	516	214	9405	9574
Duluth	41	108	278	808	1035	1347	1654	1464	1223	897	472	176	9503	9981
International Falls	63	123	323	863	1119	1476	1886	1579	1274	879	476	167	10228	10600
Minneapolis	1	12	143	633	883	1284	1488	1313	1042	715	237	37	7788	7853
Rochester	13	29	190	706	912	1308	1477	1286	1054	760	270	44	8049	8095
St. Cloud	16	38	213	722	1001	1324	1601	1414	1130	767	325	75	8626	8893
St. Paul	0	11	138	635	871	1274	1465	1300	1020	690	226			
MISSISSIPPI														
Jackson	0	0	0	217	350	503	394	391	126	112	3	0	2096	2202
Meridian	0	0	0	251	357	540	415	410	166	126	0	0	2265	2333
Vicksburg (CO)	0	0	0	185	321	476	362	371	94	99	2	0	1910	2000
MISSOURI														
Columbia	0	0	51	388	621	927	943	705	595	435	127	0	4792	5113
Kansas City	0	0	25	312	605	950	937	685	579	431	149	0	4673	4888
St. Joseph	0	0	40	402	702	1055	1048	766	679	493	178	1	5364	5336
St. Louis (CO)	0	0	10	315	528	832	890	652	513	385	66	0	4193	4469
St. Louis	0	0	29	368	572	864	914	693	558	403	82	0	4483	4699
Springfield	0	0	35	383	623	889	841	675	488	443	125	0	4502	4693
MONTANA														
Billings	25	31	75	427	947	1001	886	906	819	734	424	125	6400	7106
Butte	163	157	332	647	1321	1454	1093	1144	1048	901	685			
Glasgow (CO)	19	44	126	592	1016	1409	1472	1158	1087	802	415	94	8234	8690
Great Falls	62	65	129	450	934	1001	1005	942	890	796	485	203	6962	7555
Havre (CO)	45	54	122	564	1014	1288	1273	1011	951	783	420	147	7672	8213
Helena	58	51	174	563	1157	1305	937	942	904	748	516	222	7577	8250
Kalispell	110	101	246	575	1019	1155	937	911	865	713	460	267	7359	8055
Miles City	16	30	92	522	1021	1189	1160	1022	895	775	442	100	7264	7822
Missoula	82	59	171	514	1041	1203	897	924	840	680	511	257	7179	7873
NEBRASKA														
Grand Island	5	0	66	439	841	1190	1176	902	710	603	252	19	6203	6311
Lincoln (CO)	0	0	41	404	756	1166	1199	839	694	533	193	10	5835	5865
Lincoln	1	0	52	448	795	1208	1227	858	720	548	196	12	6065	6104
Norfolk	0	83	499	891	1277	1330	999	1064	827	655	252	17	6897	7065
North Platte	9	2	92	522	1014	1220	999	984	760	651	299	25	6577	6546
Omaha	0	0	60	445	777	1180	1243	921	752	551	186	10	6125	6160
Scottsbluff	21	6	78	441	1030	1145	899	1006	732	694	336	42	6430	6841
Valentine (CO)	14	4	101	520	973	1243	1128	1090	867	763	324	41	7068	7075
NEVADA														
Elko	6	17	137	423	1071	1108	891	921	842	679	613	210	6918	7335
Ely	20	9	176	439	1138	1248	973	954	920	749	687	225	7538	7443
Las Vegas	0	0	0	1	458	598	446	450	268	102	60	0	2383	2425
Reno	4	12	107	330	907	952	755	819	759	579	527	235	5986	6036
Tonopah	0	0	75	146	1013	1013	788	793	702	518	469	98	5813	
Winnemucca	7	16	136	388	1013	977	780	861	799	644	550	216	6387	6369
NEW HAMPSHIRE														
Concord	2	24	151	554	807	1117	1153	1040	914	593	247	86	6608	7612
Mt. Washington	373	514	671	1205	1284	1617	1661	1650	1550	1253	856	588	13222	
NEW JERSEY														
Atlantic City (CO)	0	0	12	300	480	762	753	684	616	396	116	24	4143	4741



# MONTHLY AND SEASONAL HEATING DEGREE DAYS

1952 - 1953

Table 3A-Continued

State and Station	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total for Season	Normals July-June
NEW JERSEY (Cont'd.)														
Newark	0	0	22	360	549	860	876	763	680	405	107	15	4637	5252
Trenton (CO)	0	0	29	367	544	840	848	741	655	394	108	25	4551	5068
NEW MEXICO														
Albuquerque	0	0	13	134	740	965	700	732	500	298	200	0	4282	4389
Clayton	6	0	59	329	834	937	716	857	580	495	277	2	5092	5138
Raton	13	0	148	437	996	1111	883	978	733	597	390	16	6302	6417
Roswell	3	0	14	200	616	770	538	617	299	171	108	0	3336	3424
NEW YORK														
Albany	0	13	130	566	747	1071	1101	1005	861	544	183	47	6268	6962
Bear Mountain (CO)	0	20	103	517	694	1043	1052	938	872	577	133	0	9286	9940
Binghamton	7	34	168	619	756	1115	1132	1044	966	689	255	97	6882	7537
Buffalo	0	15	123	569	654	975	1038	956	876	625	276	44	6151	6838
New York (CO)	0	1	13	325	501	821	832	755	665	417	116	17	4463	5050
La Guardia Field	0	0	10	286	477	799	829	727	663	377	102	11	4281	4989
Oswego (CO)	3	3	110	513	649	989	1053	984	865	603	254	51	6102	6863
Rochester	1	13	109	548	659	973	1058	968	865	603	254	51	6102	6863
Schenectady	0	8	111	542	711	1036	1062	971	833	511	159	25	5969	6520
Syracuse	2	13	103	516	669	1022	1064	988	866	573	225	55	6096	6520
NORTH CAROLINA														
Asheville (CO)	0	1	38	355	563	793	701	631	483	318	30	0	3913	4072
Asheville	0	11	68	412	614	840	728	666	511	353	37	5	4245	4532
Charlotte	0	0	6	250	404	701	560	497	376	191	1	0	2993	3205
Greensboro	0	0	21	332	490	771	653	574	482	252	7	1	3583	3810
Hatteras (CO)	0	0	0	96	245	532	419	408	314	135	2	0	2151	2392
Raleigh (CO)	0	0	7	244	378	674	521	503	392	178	0	0	2897	3075
Raleigh	0	0	15	294	420	715	561	532	417	207	3	2	3166	3369
Wilmington	0	0	0	170	290	561	421	402	267	125	0	0	2236	2323
Winston-Salem	0	0	14	291	452	725	622	541	432	231	5	2	3315	3721
NORTH DAKOTA														
Bismarck	14	35	146	642	1031	1374	1519	1193	1190	826	390	104	8464	9033
Devils Lake (CO)	26	52	207	730	1056	1493	1721	1360	1246	871	391	133	9286	9940
Fargo	16	35	166	711	1020	1430	1690	1360	1139	819	331	102	8819	9274
Grand Forks	23	54	205	747	1060	1461	1759	1411	1189	822	362	110	9203	9203
Pembina	27	45	159	691	1073	1440	1789	1491	1240	792	360	105	9212	9212
Williston (CO)	27	53	151	614	1000	1329	1511	1210	1137	861	433	134	8460	9068
OHIO														
Akron	7	15	116	570	690	994	1014	927	823	624	157	29	5966	6203
Cincinnati (CO)	0	0	22	367	518	793	795	660	530	366	29	0	4080	4532
Cincinnati	0	1	62	451	608	873	877	754	626	469	58	1	4780	5195
Cleveland (CO)	1	7	64	450	555	875	919	823	739	567	179	19	5198	5717
Cleveland	3	6	79	486	623	929	969	874	765	581	129	10	5454	6006
Columbus	0	5	67	505	645	913	915	817	691	500	79	9	5146	5615
Dayton	0	4	69	490	653	935	961	841	702	531	88	3	5277	5597
Sandusky (CO)	0	0	74	441	598	905	962	855	738	573	148	6	5300	5859
Toledo	0	11	94	528	668	987	1036	921	790	608	149	13	5805	6394
Youngstown	9	24	123	564	678	994	994	920	825	627	166	37	5961	6172
OKLAHOMA														
Oklahoma City (CO)	0	0	4	187	497	795	672	559	302	284	103	0	3403	3519
Oklahoma City	0	0	4	182	512	797	681	583	329	285	105	0	3478	3644
Tulsa	0	0	4	228	523	783	732	546	328	301	91	0	3536	3584
OREGON														
Baker (CO)	49	55	132	353	963	1111	837	913	823	624	157	29	5966	6203
Baker	68	70	199	490	1064	1191	883	962	859	649	544	302	6761	6918
Burns (CO)	30	26	122	332	964	1196	907	847	842	649	544	302	6761	6918
Eugene	18	37	82	280	788	719	556	600	615	456	361	211	4723	4779
Meacham	96	113	174	321	970	1094	870	948	948	785	612	477	7408	7888
Medford	1	3	36	191	776	812	702	623	608	410	363	158	4683	4547
Pendleton	6	10	57	229	924	886	589	661	603	463	314	157	4899	5204
Portland (CO)	12	8	49	126	653	654	505	544	543	394	276	166	3930	4143
Portland	18	15	66	197	725	718	539	586	586	445	326	186	4407	4632
Roseburg	2	13	50	221	761	704	554	616	620	443	364	230	4578	4578
Salem	24	42	87	232	785	736	553	607	616	467	336	215	4700	4574
Sexton Summit (CO)	60	79	135	200	652	939	790	785	857	674	666	469	6306	6217
Troutdale	31	29	67	148	660	727	527	587	583	467	336	215	4700	4574
PENNSYLVANIA														
Allentown	0	7	65	470	657	945	971	841	750	481	132	30	5349	5880
Eric (CO)	0	9	85	478	571	896	922	857	799	591	232	32	5472	6116
Harrisburg	0	4	48	423	608	888	889	754	678	417	71	19	4799	5258
Park Place (CO)	4	24	127	562	732	1088	1096	976	895	623	206	68	6401	7175
Philadelphia (CO)	0	0	10	295	487	785	799	693	592	345	71	16	4093	4523
Philadelphia	0	0	21	348	543	814	833	725	610	361	70	18	4343	4866
Pittsburgh (CO)	0	3	38	411	531	853	806	752	659	436	48	2	4539	5048
Pittsburgh	0	10	73	487	607	933	885	748	639	402	16	0	5231	5905
Reading (CO)	0	0	32	366	574	847	857	734	645	393	71	21	4540	5060
Scranton (CO)	0	14	94	477	645	949	972	864	780	517	142	41	5495	6047
Williamsport	0	10	93	518	686	963	967	871	769	510	116	28	5531	5898
RHODE ISLAND														
Block Island	0	2	64	342	563	837	876	796	784	534	285	72	5155	5843
Providence (CO)	0	3	69	364	571	887	901	801	748	546	214	36	5359	6125
Providence	0	8	82	414	616	927	937	844	787	494	214	36	5359	6125
SOUTH CAROLINA														
Charleston (CO)	0	0	0	101	188	461	350	290	157	65	0	0	1612	1769
Charleston	0	0	0	149	253	523	382	338	180	105	0	0	1930	1973
Columbia (CO)	0	0	0	177	269	574	416	381	249	109	0	0	2175	2284
Columbia	0	0	0	209	315	620	467	423	282	137	0	0	2453	2435
Florence	0	0	0	192	294	596	425	403	266	119	0	0	2295	2507
Greenville	0	0	0	206	386	668	569	499	347	174	2	0	2851	3060
Spartanburg	0	0	3	229	402	682	569	508	359	172	2	0	2926	3044
SOUTH DAKOTA														
Huron	5	7	118	600	934	1281	1432	1222	1012	728	298	41	7678	7902
Pierre	5	31	76	523	923	1215	1355	1160	1002	726	316	40	7372	7535
Rapid City	21	10	74	454	913	1080	1038	1095	872	792	392	68	6809	7535
Sioux Falls	5	3	124	597	929	1314	1446	1189	991	725	273	41	7637	7846
TENNESSEE														
Bristol	1	2	32	386	628	805	713	657	490	343	26	0	4083	4148
Chattanooga	0	0	8	305	490	707	587	538	366	237	20	0	3258	3384
Knoxville	0	0	3	284	548	746	622	560	389	274	21	0	3447	3590
Memphis	0	0	4	326	469	647	588	506	268	215	31	0	3054	3137
Nashville	0	0	11	377	492	697	609	583	367	282	14	0	3432	3513
TEXAS														
Abilene	0	0	4	127	385	596	403	435	162	102	72	0	2286	2657
Amarillo	0	0	25	226	667	859	623	686	366	319	170	0	3941	4345
Austin	0	0	0	74	276	449	270	322	68	60	24	0	1543	1713
Big Spring	1	0	16	92	426	594	393	482	170	97	60	0	2331	2480

# MONTHLY AND SEASONAL HEATING DEGREE DAYS

1952 - 1953

Table 3A-Continued

State and Station	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total for Season	Normals July-June
<b>TEXAS (Cont'd.)</b>														
Brownsville	0	0	0	5	91	157	91	85	10	3	3	0	445	617
Corpus Christi	0	0	0	14	148	244	160	180	20	8	2	0	776	1011
Dallas	0	0	0	144	347	571	429	406	128	124	42	0	2191	2272
Del Rio	0	0	0	18	244	406	261	252	46	13	9	0	1249	1407
El Paso	0	0	0	47	459	642	450	468	211	69	64	0	2410	2641
Ft. Worth	0	0	0	107	341	563	404	394	133	127	42	0	2111	2361
Galveston (CO)	0	0	0	33	168	288	210	253	32	27	0	0	1011	1211
Galveston	0	0	0	36	167	297	224	262	36	25	0	0	1047	1233
Houston (CO)	0	0	0	51	218	327	233	252	23	30	3	0	1137	1276
Houston	0	0	0	58	233	352	263	263	28	33	2	0	1232	1388
Laredo	0	0	0	9	156	251	124	160	14	4	5	0	724	781
Lubbock	4	0	23	206	604	761	562	618	306	212	141	0	3437	3587
Palestine (CO)	0	0	0	114	306	492	390							
Port Arthur (CO)	0	0	0	65	215	353	239	272						
Port Arthur	0	0	0	94	243	381	278	278	36	38	0	0	1348	1517
San Angelo	0	0	0	100	362	527	344	402	122	68	61	0	1986	2107
San Antonio	0	0	0	61	250	411	278	297	45	36	19	0	1397	1579
Victoria	0	0	0	48	198	318	210	228	197	106	4	0	1064	1126
Waco	0	0	0	111	319	522	345	376	111	89	33	0	1906	2025
Wichita Falls	0	0	0	129	426	673	507	473	210	173	69	0	2660	3025
<b>UTAH</b>														
Milford	0	0	87	305	967	1058	842	980	754	557	452	54	6056	6445
Salt Lake City (CO)	0	0	19	159	842	952	731	749	618	507	328	45	4950	5463
Salt Lake City	0	0	36	231	915	1014	784	779	664	551	367	64	5405	5866
<b>VERMONT</b>														
Burlington	4	15	143	594	755	1174	1241	1099	952	627	231	64	6899	7865
<b>VIRGINIA</b>														
Cape Henry (CO)	0	0	0	183	365	649	568	504	438	228	11	3	2949	3307
Lynchburg	0	4	42	338	498	803	727	635	545	228	12	3	3835	4153
Norfolk (CO)	0	0	0	179	338	621	535	481	386	179	2	1	2722	3119
Norfolk	0	0	7	228	407	670	580	520	424	212	9	0	3057	3454
Richmond (CO)	0	0	11	281	427	751	654	561	485	222	4	4	3400	3730
Richmond	0	1	19	316	460	792	680	598	509	234	7	6	3622	3955
Roanoke	0	0	40	330	517	785	719	621	530	303	7	1	3856	4152
<b>WASHINGTON</b>														
Ellensburg	33	45	99	342	1009	1069	931	774	752	591	391	236	6272	6542
Kelso	71	68	142	308	747	732	573	621	635	504	351	243	4995	5239
North Head (CO)	267	218	233	278	520	622	551	561	594	509				
Olympia	77	111	164	370	742	777	641	677	677	541	376	264	5417	5501
Port Angeles	278	259	266	397	611	656	640							
Seattle (CO)	39	30	88	232	580	609	545	576	578	434	275	187	4173	4438
Seattle	79	97	178	327	712	714	636	688	676	538	383	278	5306	5275
Spokane	28	39	100	320	961	1069	832	834	765	574	383	231	6136	6852
Stampede Pass (CO)	246	285	286	458	1043	1198	1006		1081	920	767			
Tacoma (CO)	66	66	139	290	648	654	566	610	616	488				
Tatoosh Island (CO)	334	296	298	381	548	619	603	584	656	534	423	362	5638	5794
Walla Walla (CO)	2	2	34	166	858	826	598	598	523	386	232	85	4220	4848
Yakima	20	44	80	279	952	1002	805	698	666	500	306	186	5538	5845
<b>WEST VIRGINIA</b>														
Charleston	0	1	47	409	541	778	705	673	543	373	25	4	4099	4417
Elkins	4	20	158	579	682	943	884	853	749	514	72	30	5488	5773
Huntington (CO)	0	0	24	352	475	712	706	655	505	359	15	0	3803	4073
Parkersburg (CO)	0	3	54	418	559	826	778	721	604	411	29	3	4406	4750
Petersburg (CO)	0	9	78	395	555	898	806	717	622	406	27	18	4530	4966
<b>WISCONSIN</b>														
Green Bay	18	36	213	720	844	1215	1369	1290	1049	707	339	50	7850	8259
La Crosse (CO)	0	13												
La Crosse	1	8	133	612	800	1236	1384	1239	990	679	228	26	7336	7650
Madison (CO)	0	13	127	574	753	1135	1280	1115	949	664	267	18	6895	7300
Madison	1	20	149	636	769	1158	1300	1112	961	651	246	18	7021	7417
Milwaukee (CO)	5	13	92	524	717	1027	1173	1020	905	651	312	54	6493	6944
Milwaukee	4	14	126	573	749	1061	1216	1043	922	672	302	57	6739	7205
<b>WYOMING</b>														
Casper	42	22	121	470	1103	1132	992	1116	877	387	503	86	6851	7638
Cheyenne	58	30	150	507	1083	1079	907	1042	855	844	503	111	7169	7562
Lander	36	21	95	457	1147	1287	1021	1135	930	783	542	129	7583	8303
Rock Springs (CO)	22	18	151	467	1181	1310	990	1019	900	771	555	117	7501	
Rock Springs	41	32	153	455	1207	1344	1078	1104	951	831	613	138	7947	8-13
Sheridan	40	31	111	488	1019	1103	962	1020	854	779	476	127	7010	7903
<b>ALASKA</b>														
Anchorage	237	299	555	832	1003	1460	1800	1243	1332	805	542	199	10307	
Annette Island	245	212	352	466	703	784	1099	738	812	621	457	328	6817	
Barrow	744	811	1075	1482	1793	2341	2540	2410	2523	1877	1382	907	19885	
Bethel	328	388	615	938	1170	1944	2008	1613	1952	1088	628	316	12988	
Cordova	434	379	527	678	819	1029	1354	926	1142	801	631	365	9085	
Fairbanks	158	336	665	1062	1481	2119	2717	1743	1779	828	411	111	13410	
Galena	167	380	722	1117	1479	2128	2707	1925	2016	1090	491			
Gambell	686	629	717	973	1093	1687	1916	1915	1989	1418	1101	728	14852	
Juneau	286	333	481	616	793	975	1428	851	1038	714	483	258	8256	
Kotzebue	384	438	738	1145	1363	1893	2351	1994	2128	1411	903	642	15390	
McGrath	209	390	679	1070	1443	2178	2568	1788	1853	964	539	226	13907	
Nome	458	446	703	1020	1189	1702	1943	1698	1939	1187	718	566	13569	
Northway	204	367	716	1159	1685	2413	3066	1934	1865	998	524	218	15149	
St. Paul	661	581	625	780	898	1183	1261	1292	1420	1068	914	678	11361	
Umiat	316	562	1104	1530	1850									
Yakutat	387	330	496	635	771	983	1304	889	1059	763	620	411	8648	

Data from airport unless otherwise specified. CO indicates data from city office.



## SEVERE STORMS

Table 4

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Florida Keys and extreme northwest- ern Florida	1-6								Tropical storm	From 1st to 3d storm drifted around in Eastern Gulf of Mexico west and southwest of Key West. On 4th center passed about 60 miles west of Dry Tortugas and moved very near parallel to west coast of Florida and passed inland a short distance west of Panama City, about noon of 6th. Winds below hurricane force during entire history of this storm and highest winds experienced on land were 40 to 45 m.p.h. Rains associated with storm beneficial.
Lower Allen Township, Cumberland County, Pa.	1-3						Tens of thou- sands		Rains	Series of heavy rains at end of May raised ground water levels so that underground water pressure developed cracks in basement floors and walls, followed by flooding until ground water pressure diminished.
Grover (near), Colo.	1	3-6 p.m.	*20	30				\$5,000	Hail	Storm covered large area in sparsely settled and cultivated area.
Bertie, Halifax and Northampton Counties, N. C.	1	4-5 p.m.						655,000	do	80 square miles damaged. Heaviest damage to cotton crop in Northampton County.
Dillon Coun- ty (upper portion), S. C.	1	Afternoon		5			\$8,000	12,000	Wind and rain	Much cotton and tobacco had to be replanted.
Pine Hill - Bolentown section, Orangeburg County, S.C.	1	4-5 p.m.		10	0	1	35,000	65,000	Tornado and hail	1 person reported sighting column similar to brush fire, apparently tornado funnel.
Gordon (near), Nebr.	1	Late evening	*1	1-2			1,000		0 Thunder- storm	
Norton Coun- ty, Kans.	2	12:15- 12:30 a.m.			0	0	0	0	0 Tornado, rain, wind, and hail	Tornado cloud observed about 14 miles west of Norton moving east-northeastward. Cloud appeared to rise after 12:30 a.m. High wind, rain, and some soft hail at Norton at 12:30 a.m.
Gordon (25 miles south of), to near Crook- ston, Nebr.	2	3 p.m.	Nar- row	70 to 80	0	0	Light	0	0 Tornado	Path through very sparsely settled range country, no crops in area.
Whitman (12 to 14 miles north of), Nebr.	2	3:40 p.m.	Nar- row	15	0	0	1,000	0	0 do	Sparsely settled range country, no crops grown.
Chadron (east of), Nebr.	2	3:45 p.m.	Nar- row	1 to 2	0	0	0	0	0 do	Funnel cloud observed, path in uninhabited country.
Eagle Butte, Dewey Coun- ty, S. Dak.	2	5 p.m.		6	0	0	*50,000		do	Grain elevator destroyed, 2 airplanes and 2 hangers damaged, several large barns and small buildings blown down, and power lines went down from flying debris. Roof of lumber yard blown off; a 2x4 driven into telephone pole. Storm path toward northeast
South Dako- ta, central	2	Evening							Wind and hail	In area forming triangle from Little Eagle in Corson County to Oglala and Pine Ridge in Shannon County to Pickstown in Charles Mix County, wind- and hail-storms hit at various points. In area east, north, and northeast of Midland in Haakon County a large barn destroyed. Another barn and 2 houses damaged. West of Oglala in Shannon County, hail heavy. To north of Oglala, extending to Manderson, wind caused damage to smaller buildings. Mission reported \$2,000 damage to buildings in Todd County. Wood and Cedarbutte in Mellette County reported high wind and hail.
Saginaw, Mich.	4	6:30 a.m.					1,000		Electri- cal	Lightning crumpled chimney of new school and set off city air raid siren.
Saginaw, Mich.	4	10 a.m.					3,000	700	Hail	Hail, occasionally size of baseballs, broke many windows in 4 greenhouses.
Wisconsin, eastern and southern portions	4	Forenoon					50,000		Electri- cal, wind, and hail	High winds and lightning disrupted power and tele- phone lines. Hail size of pingpong balls broke over 1,000 windowpanes in greenhouses at Watertown.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Detroit, Mich.	4	3:30 p.m.			2				Electrical	2 small boys killed by lightning as they took shelter under tree.
Dry Tortu- gas, Fla.	4	4:30 p.m.			0	0			Water- spout	Small waterspout passed over island. Little damage resulted.
Gruver, Hansford County, Tex.	4	4:45 p.m.					Heavy		Wind and hail	Crops damaged by hail. Wind estimated at 60 m.p.h. Hailstones 1 inch in diameter. No serious damage from wind.
James City- Kane area, Pa.	4	Evening					°Several hundred		Hail, winds, and elec- trical	Hail in James City area accumulated to 2 inches in depth on porches, broke windows, damaged roofs, and flattened gardens. High winds damaged trees and utility lines. Lightning caused minor damage, mostly to fuses.
Saline Coun- ty, Kans.	4	Evening							Hail	Wheat on 10 to 12 farms from 4 miles west of Salina to west city limits damaged 15 to 40 percent in local hailstorm. Light building damage in Salina.
Midland, Midland County, Tex.	4	8:30 p.m.					\$50,000		Hail and wind	Power lines knocked down; several buildings demol- ished; roofs damaged. Winds estimated as high as 80 m.p.h. Hail size of marbles.
Beckham County, Okla.	4	10-10:40 p.m.			0	0		\$3,000	Hail and tornado	Hail up to 1 inch in diameter in small area in north- western part of County. An unconfirmed report of tornado cloud not reaching ground west of Sayre.
Between Beaver and Elmwood, Beaver Coun- ty, Okla.	4	Night						3,000	Hail	Damage to several hundred acres of wheat.
Wisconsin, southern portion	4	Night			1		°750,000		Electrical, wind, and rain	Considerable wind and lightning damage. Over 4,000 telephones out of service. Roller coaster demol- ished in Waukesha County. 23 purebred holstein cows killed by lightning near Plymouth. Power lines disrupted by broken tree limbs and lightning. Heavy rain flooded more than 1,000 basements in northern Milwaukee and Ozaukee Counties. Many underpasses and considerable low farm land inundated.
Harper Coun- ty, Kans.	4	11 p.m.				1	3,000		Electrical	In north-central Harper County barn struck by light- ning and burned; contents of tractor, 1950 Chevrol- et, wheat, hay, seed, and tools also complete loss. Owner burned while trying to save contents.
Illinois, extreme northern counties	4-5	Night					50,000		Wind and rain	Strong winds downed trees, damaged utility lines, and smashed windows in several counties along Wisconsin border, also in Cook County. Heavy rains also caused flooding in some localities.
Iowa, widely scattered localities	4						5,000		Wind	Barn demolished northwest of Elkader; drive-in thea- ter near Shenandoah damaged; chicken house near Dallas Center demolished; tree damage in Oelwein; power outage at Cedar Falls.
Las Animas, Colo.	5	2 a.m.					25,000		Electrical	A store building and contents completely destroyed by fire as a result of being struck by lightning.
Farmington Canyon (about 18 miles north of Salt Lake City), Utah	5	9 a.m.			0				Tornado	Definitely a tornado, but did not reach ground in populated areas and no damage done. Third tornado officially reported in State.
St. Peters- burg, Fla.	5	9:45 a.m.			0	0			0 do	Struck Lealman, northern suburb of St. Petersburg. Ripped boards from piles of lumber and sailed them through air. Carried 1 small building 125 feet.
Carthage, Mo.	5	10 a.m.					20,000		Electrical	Large residence burned when hit by lightning.
Denver, Colo.	5	11:30 a.m.— noon	*15	35			20,000	4,500	Hail, rain, and elec- trical	Violent electrical storm, accompanied by hail and rain, extended from metropolitan Denver southward to distance of 35 miles. Lightning caused power fail- ures and started several fires. A number of fire- balls caused considerable confusion and fright. Hail damaged roofs, greenhouses, and some cars and wooden buildings. Basements flooded in several sections of Denver.
South Bend- Mishawaka area, Ind.	5	12:40- 6:40 p.m.					6,700		Wind and electrical	Lightning struck at least 2 homes. Wind damaged TV antennae and blew down a few trees, signs, electric wires, etc. Wind damage 55 percent, lightning 45 percent.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Canton, Ill.	5	1 p.m.	*1½		1	1	\$50,000		Wind	Man killed and several homes and cars damaged by falling trees.
Rich Hill, Mo.	5	Afternoon					2,000		Electri- cal	8 head of large beef cattle killed by lightning.
Wisconsin, southern portion	5	Afternoon					75,000		Wind and hail	Squall line moved eastward, causing scattered damage to trees, power and telephone lines, and small buildings. Scattered hail damage in some areas.
Wellington and sur- rounding area, Col- lingsworth County, Tex.	5	1:30 p.m.			0	0			Tornadoes	Cotton and feed crops destroyed; roofs damaged; trees uprooted. 3 tornado clouds observed. 1 touched ground in open field.
Beckham and Roger Mills Counties, Okla.	5	3-4 p.m.	*3	12			15,000	\$8,000	Hail	Scattered hail in several areas from Hammon south to south of Carter. Hardest hit was Merritt School community southeast of Elk City where 37 windows broken and many roofs damaged, totaling \$1,600. Damage to Berlin School northwest of Elk City, \$1,250. Damage in Elk City, \$4,000. Hail ¾ to 2 inches in diameter; 50 percent of ground covered.
Weatherford (7 miles southwest of), Custer and Washita Counties, Okla.	5	3-5 p.m.	*1	7				42,000	do	Hail size of marbles to golf balls. Up to 68 percent damage to wheat.
Spring Val- ley, Ill.	5	3:15 p.m.					50,000		Electri- cal	Lightning caused fire which destroyed large garage.
Granite and vicinity, Greer Coun- ty, Okla.	5	3:20-5:30 p.m.	*6 to 8	20			20,000	175,000	Wind and hail	Storm moved east-northeastward. Moderate hail 1½ inches in diameter. Grain elevator at Granite blown down. Tornado reported 2 miles south of Granite, but others seeing same cloud called it only straight wind; visibility restricted by hail and rain so no tornado could have been seen; therefore, considered straight wind. Much wheat destroyed by wind and hundreds of acres of cotton had to be replanted. Estimated damages, included in total: wind to crops, \$163,000; hail to crops, \$12,000; wind to build-ings, \$20,000.
Canton Lake (near and over), Blaine Coun- ty, Okla.	5	3:30 p.m.	100	**500	0	0	225	0	Tornado and electri- cal	Moved northeastward. Tornado observed by workers at concession stand. It carried weeds and debris up into cloud. Damage by tornado, \$75; by lightning, \$150.
Cook, Lake, and McHenry Counties, Ill.	5	3:30 p.m.				2	250,000		Electri- cal, wind, and hail	Wind destroyed theater in Lake County, downed many trees, and caused other property damage. Lightning injured 2 persons and set fire to a building in Chicago. Hail in some localities.
Jackson County, Okla.	5	4-6:30 p.m.	*8	15			5,000	80,000	Hail	Path eastward across northern edge of County, af-fecting Balir and several other communities.
Hydro and Bridgeport (in and around), Blaine and Caddo Coun- ties, Okla.	5	4-5 p.m.					1,000		Winds	Scattered damage to buildings and windmills. Church at Bridgeport moved from its foundation.
Plymouth, Mich.	5	4:05-4:10 p.m.	50	1			300	50	Tornado and wind	Tornado began 2 miles east of Plymouth, then lifted and passed through tops of trees for a mile in east-northeasterly direction. A couple of branches im-bedded in roof of nearby house. Power lines blown down on Newburg and Amrhein roads. 25 percent of dam-age attributed to strong winds, other than tornadic.
Mountain View (south of), Kiowa County, Okla.	5	4:15-4:30 p.m.	200 to 300		0	0	0	0	Tornado	Observed by several persons. Moved southeastward. Came about 4 minutes before wind shifted to north-west.
Garfield, Grant, and Kay Coun- ties from north of Enid to Manchester through Wa- kita and east to Braman, Okla.	5	4:15-5:01 p.m.	*8				30,000	75,000	Hail	Hail size of marbles to eggs covered ground 60 per-cent. Damage principally to roofs in Wakita. Storm may have continued into Kansas causing minor damage.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Oklahoma City, Okla.	5	4:45 p.m.				Sev- er- al	Consider- able		Winds	Several persons hurt slightly by flying glass. Dam- age to roofs of several houses. Much tree damage.
Harmon Coun- ty (north- ern por- tion), Okla.	5	Late af- ternoon	1,760	15	0	0	\$5,000	\$95,000	Hail and tornado	Hail size of baseballs did considerable damage to farm homes and buildings. Crowds saw perfect tor- nado funnel high in clouds to west of Vinson. It touched ground a few times, but no damage by tornado.
Perry (north, west, and southwest of), Noble County, Okla.	5	5-7 p.m.	*4	20	0	0	149,500	500	Winds, torna- does, hail, and electri- cal	Many farms suffered damage over large area. Light- ning caused about \$500 damage and hail about \$500. Most damage by wind. 2 tornado clouds, not reach- ing ground, observed southwest and west of Perry.
Bridgeport to Saginaw, Mich.	5	6 p.m.		5	0	0	\$40,000		Tornado	Tornado traveled northeastward from point 1 mile northeast of Bridgeport to about 5 miles east of Saginaw. Several barns destroyed. Electric and telephone services off for about 4 hours.
Kansas to southeast- ern Dundy County, Nebr.	5	6:15 p.m.	Nar- row	10	0	0	24,000	15,000	Tornado and hail	Path of hail 1/2 mile wide.
Kansas, southeast- ern portion	5	Early evening			0	0	0		Tornadoes, electri- cal, and hail	Reports of 5 separate funnels received from this area: 2 near Howard, Elk County, about 7:30 p.m.; 2 at Coffeyville, Montgomery County, between 7 and 7:30 p.m., where winds to 55 m.p.h. blew down trees and limbs; and 1 south of Baxter Springs, Cherokee County, which damaged home and gift shop. Elec- trical storm with light hail in local areas oc- curred throughout much of southeastern Kansas.
Burlington (8 miles north of), Iowa	5						4,000		Wind	Brick wall of pumping station demolished.
Tulsa, Okla.	5	7-10:30 p.m.	*10				10,100		Winds and electri- cal	Many minor claims for wind damage. Principal loss estimated at \$10,000, by lightning to electrical equipment.
Dewey (2½ miles north- east of), Washington County, Okla.	5	8:20 p.m.	50	2	0	0	3,000	0	Tornado	4 buildings damaged or destroyed. Funnel observed; appeared smaller than most tornadoes.
Stephens County, Okla.	5	8:30-9 p.m.; also 11:30 p.m.- midnight	*15				600,000	75,000	Hail	About 50 insurance claims in area west of Marlow to south of Marlow. Also in Central High area east of Marlow to east of Marlow in Clear Lake area. Latter storm may have been part of storm moving from Comanche County.
Wynnewood (south edge of, south and east of), Garvin County to northern Murray County, Okla.	5	9:15 p.m.	*2	15	0	1	50,000	175,000	Tornado, wind, and hail	Hail losses to crops \$175,000; to property \$25,000; tornado losses to property \$50,000 (included in total). Moved southeastward. 4 homes flattened at Wynnewood; damage to at least 15 farms south and east of Wynnewood. Hail south of Wynnewood piled 7 inches deep on highway. Width of hail- storm 2 miles. Tornado path narrow. Hail 3/8 to 1/2 inch in diameter and up to 1 inch, covering about 75 percent of ground. 1 person injured by high wind 5 miles north of Sulphur. Tornado may have lifted and moved aloft over Sulphur where roar was heard, but no damage.
Roff to Fitzhugh to Stonewall, Pontotoc County, Okla.	5	9:45- 10:15 p.m.	*2	20	0	0	100,000	100,000	do	Damage to buildings on 20 or more farms. Path of hail 2 miles wide. Tornado path narrow and short. Storm moved east-northeastward. \$95,000 damage by hail to corn, cotton, oats, and feed crops; \$5,000 damage by hail to roofs and windows.
Kiowa Coun- ty, Okla.	5	Evening					10,000	50,000	Rain and hail	Hail damage in northwestern part of County, also at Komalty and 9 miles south of Hobart. 20 to 100 percent damage to wheat in large areas. Some hail damage in Hobart. Heavy rains in Roosevelt area; amount of damage by heavy rain considerable. Dam- ages listed are for hail losses.
Wilson (in and near), Carter County, Okla.	5						10,000		Wind	Damage to drive-in theatre; also to garage.

See footnotes at end of table.



## SEVERE STORMS

Table 4-Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Coal County, Okla.	5	10:30- 11:15 p.m.	*2	15				\$50,000	Hail	Hail, small size, completely covered ground in places 2 to 6 inches.
Lawton, Elgin, and Wichita Mountain Wild Life Refuge areas, Co- manche County, Okla.	5	11 p.m.- midnight			1		\$10,000	10,000	Hail, wind, and electri- cal	Damages due to hail. 1 person in Lawton killed by lightning. 3 hailstorms reported in area during period. Some hail size of baseballs struck southwest of Elgin, with hail losses on 7 farms. Light hail damage to gardens in Lawton. Hail in Wichita Mountain Wild Life area piled up to 2 inches deep; marble size. No property or crop damage in Refuge because nothing to be damaged, except trees.
Wewoka, Sem- inole Coun- ty, Okla.	6	1:30-2:20 a.m.					13,750		Electri- cal	Damage by lightning to church, also to electrical and telephone circuits.
Ryan, Jef- ferson County, Okla.	6	2:10 a.m.	*1	3			750		Winds	2,500 square feet of roofing blown off; 5 windows blown out. Other damage to buildings.
Brazil, Ind.	6	12:15- 12:40 p.m.	*3	3			40,000	50,000	Wind, hail, and electri- cal	Wind blew over ferris wheel, ripped down several tents, trees, etc. Hail severely damaged crops in nearby rural area.
Greene Coun- ty, N. C.	6-7	1 p.m.- 3 a.m.						22,400	Thunder- storms with hail	2½ square miles damaged, mostly tobacco.
Columbus and Clickenger Airport, Franklin County, Ohio	6	2 p.m.					17,500		Wind	50 m.p.h. winds, accompanying thunderstorm, destroyed 6 small airplanes, damaged 3 small airplanes, tore roof off hangar. Tree toppled against home in Columbus, causing \$2,500 property damage. Trees downed also.
Douglas, Ga.	6	2:55-3 p.m.	200 to 400	Short		1	7,500		do	Storm moved northeastward through business area of Douglas. Several building roofs sustained moderate to heavy damages, with plate-glass windows broken. Several cars damaged. A few utility lines torn down. Red Cross indicated damage to 21 homes and 15 other buildings; 30 families affected.
Dexter, Me.	6	3:15-3:45 p.m.	34	**100 to 300	0	0	500	0	Tornado	Tornado struck at farm property about 2 miles north of village center. It demolished a 20 ft. by 30 ft. storehouse. Eyewitnesses stated that storehouse was lifted 3 times into air before it was smashed to ruins.
Between Meadow Bridge and Elton, W. Va.	6	4-6:30 p.m.							Rain	Small highway bridge washed away; road covered with debris; basements flooded; gardens and field crops washed away.
Panhandle, Carson County, Tex.	6	4 p.m.				1			Wind and hail	Wind destroyed barn and some windmills. Hail damaged some crops.
Amarillo, Tex.	6	4:40 p.m.					1,800		Wind	65 m.p.h. peak gust. Scattered damage, mostly in east and northeast part of city.
Canadian, Hemphill County, Tex.	6	5:15 p.m.	880	5			5,000		Wind and hail	Trees uprooted; REA lines and telephones damaged; windmills blown over. Light structural damage; windows blown out. 100 percent wind damage. Moderate hail averaged 1/4 inch in diameter, largest 1 inch.
Pampa, Gray County, Tex.	6						1,500		Wind	TV aerials blown over; 2 private hangars destroyed.
Dimmitt, Castro County, Tex.	6								Hail	Tool and cow sheds blown over. Cotton, maize, and castor bean crops damaged.
Adams Coun- ty, Pa.	6	Evening							Rains and winds	Heavy rains washed out many fields and flooded roads. Gusty winds and swirling waters caused considerable property damage.
Chevy Chase, Md. and Washington, D. C.	6	8-9 p.m.			0	0	2,500		Wind and electri- cal	Home in Chevy Chase, Md., damaged by lightning estimated \$2,000. Damage from falling trees due to high winds in Washington, D. C. and vicinity estimated at \$500.
Grant Coun- ty, Okla.	6	8:20-10 p.m.	*1	30	0	0	2,000	25,000	Hail and torna- does	Principal damage to wheat. 2 tornado funnels in 1 cloud. Cloud split; 1 going from west of Jefferson to north of Medford; the other between Jefferson and Pond Creek traveling northeastward. Did not touch ground.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Beckham and Roger Mills Counties, Okla.	6	10-10:40 p.m.	*6	15	0	0	\$3,000	\$8,000	Hail, tornado, and rain	Hail 3/4 to 2 inches in diameter struck scattered areas. Considerable damage in Beckham County. Heavy rains in Midway and Drawford communities. Small tornado struck farmstead northeast of Cheyenne, with about \$600 damage to buildings. Except for \$600 tornado damage, losses due to hail.
Moorhead, Mont.	7	10 a.m.— 3 p.m.	*12	60			Some	Slight	Rain and hail	Some damage to roads and bridges.
Thomas, Logan, Sheridan, Graham, and Trego Coun- ties, Kans.	7	1-2:30 p.m.			0	0	16,500	1,500,000	Hail, wind, and tor- nadoes	A series of storms developed along squall line in several northwestern counties. Hail, usually driven by wind, fell in many areas; one of largest areas being non-continuous strip from central Logan County northeastward into Thomas County and continuing to north-central Sheridan County. Other hail areas included: North of Colby; north of Morland, in Graham County; and Wakeeney area. Ominous-appearing clouds suggestive of tornado formations sighted at Oakley, but tornado activity first noted 1 1/2 miles east of Morland and extended northeastward to point 10 miles north of Hill City. Report from near Hill City indicated 3 funnels from same cloud. 6 farmsteads damaged. Crop damage was by hail. Property damage \$11,500 by tornado; \$5,000 by hail.
Mason City (2 miles east of), Nebr.	7	2:30-2:50 p.m.	100	9	0	0	50,700	200	Tornado	
Belgrade (near), Nebr.	7	Afternoon				1	500	Minor	Wind	Probably incipient tornado which developed later northwest of Albion.
Giltner (5 miles northwest of), Nebr.	7	Afternoon	Nar- row	4	0	0	10,000	Minor	Tornado	3 sets of farm buildings damaged.
Phillips (6 miles southwest of), Nebr.	7	Afternoon	Nar- row	2 to 3	0	0	2,000	0 do		
Rising City (near), Nebr.	7	Afternoon	Nar- row	Short	0	4	50,000	Minor	do	
Clarkson (near), Nebr.	7	Afternoon			1				Electri- cal	Man struck and killed, no property damage.
Huffman area, Mississippi County, Ark.	7	2:30 p.m.							Hail	Stones as large as baseballs reported. No damage.
Arcadia (5 miles east of), Nebr.	7	3-4 p.m.	440	5	11	0	156,380	Moderate	Tornado	Several sets of farm buildings destroyed or damaged; 2 cars destroyed.
Northeastern Adams and north- western Clay Counties, Nebr.	7	3:30-4:30 p.m.	*3	20			Minor	20,000	Hail	
Julesburg (near), Colo.	7	P.m.			0	0	1,500	0	Twisters	5 small twisters observed during afternoon; only 1 did damage and losses were limited to small farm buildings and equipment.
Phillips and Smith Coun- ties, Kans.	7	4-6:30 p.m.					5,500	63,000	Hail and wind	Eastward movement of above-mentioned squall line (1-2:30 p.m.) brought damaging hail and wind to 2 areas: (1) At 4 p.m. strip in Phillips County about 17 miles by 2 miles from north of Logan east-north-east to north of Phillipsburg, with hailstones up to 3 inches in diameter. (2) Between 5:30 and 6:30 p.m., hail driven by wind fell from Kensington-Athol area in west-central Smith County to Lebanon area in northeast part. Most stones small, but a few near Kensington as large as baseballs. Crop damage was by hail. Property damage \$4,000 by hail; \$1,500 by wind.
Albion (northwest of), Nebr.	7	4:15-4:40 p.m.	220	9	0	0	80,000	10,000	Tornado	Some hail in adjacent areas.
Scotia (4 miles east of), Nebr.	7	4:20 p.m.	Nar- row	Short	0	0	10,000	Minor	do	Storm moved into sparsely settled region.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Macon to Up- land, Nebr.	7	4:30 p.m.	33	8 to 10	0	0	\$4,000	\$0	Tornado	
Campbell (6½ miles west of), Nebr.	7	4:30-5 p.m.	Nar- row	Short	0	0	15,500	10,000	Tornado and hail	Path of hail wider.
Octavia, Nebr.	7	Late af- ternoon			0	0	50,000	Light	do	Some spotted hail in vicinity.
Herman (near), Nebr.	7	Late af- ternoon	Nar- row		0	0	10,000	Little	Tornado (possi- ble)	
Foster (near), Nebr.	7	5 p.m.	Nar- row		0	0	500	Minor	Tornado	1 set of farm buildings struck.
Battle Creek (near), Nebr.	7	5 p.m.	Nar- row		0	0	Consider- able	Minor	do	2 sets of farm buildings badly damaged.
Pierce to Randolph, Nebr.	7	5 p.m.	Nar- row	15	0	1	31,000	10,000	do	2 other smaller tornadoes observed, which caused only minor damage.
Allen (3 miles northwest of), Nebr.	7	5:40-6:10 p.m.	Nar- row	1½	0	0	1,620	200	do	Spotted minor hail damage in vicinity.
Mitchell, S. Dak.	7	5:45 p.m.		1½	0	0	0	0	do	Funnel-shaped cloud sighted 10 miles north of Mit- chell by party of 3. Cloud traveled northward and disintegrated after 4 minutes. Funnel at base of cloud approximated a mile ahead of the tail. No damage reported. Other points in southeast, es- pecially Wessington Springs, Montrose, Scotland, and Hudson, reported wind, rain, and hail causing damage around 6 to 7 p.m. on 7th.
Augusta, Mont.	7	6 p.m.			0	0	0	0	Tornadoes	2 funnel clouds observed during thunderstorm condi- tion. 1 cloud touched ground briefly about 13 miles southeast of Augusta.
Iowa, northwest- ern portion	7	6:15-9:30 p.m.	Nar- row	#1, 10 #2, 75 #3, 30 #4, 70 #5, 20	0	0	1,350,000		Family of 5 torna- does; numerous wind- squalls	Tornado #1 moved from vicinity of Westfield into northwest corner of Johnson Township, Plymouth Coun- ty, about 6:15 p.m. Tornado #2 first reported north of Ida Grove about 7:30 p.m.; moved northeastward, skirting town of Early; came to ground again about 8:20 p.m. at Havelock and continued northeastward over Plover, between Rodman and West Bend, over Whitemore, and then north-northeastward to leave ground between Fenton and Lone Rock. Tornado #3 first reported in vicinity of Pomeroy; moved north- eastward, causing severe damage in vicinity of Pal- mer at 8:30 p.m. Continued northeastward and left ground in vicinity of Livermore. These 2 tornadoes accounted for major portion of losses. Tornado #4 first reported in vicinity of Gowrie, at 9 p.m.; moved northeastward to point southeast of Klemme, with severe damage also reported in vicinity of Duncombe at 9:20 p.m., near Holmes, and west of Belmond. Tornado #5 first reported in vicinity of Pilot Mound; moved northeastward to vicinity of Jewell, with extensive damage reported in vicinity of Stanhope. Windsqualls approaching tornado in- tensity reported in same general area, with severe damage reported in vicinity of following places: Cherokee, Royal, Forest City, Dunlap, Breda, Glid- den, Ulmer, Traer, and Dysart.
Mitchell County (southwest- ern por- tion), Kans.	7	Evening							Wind	Wind accompanying squall line thunderstorms damaged at least 3 farms from 8 to 18 miles southwest of Beloit.
Triumph (vicinity of), Minn.	7	7 p.m.		20	0	0	40,000		Tornado and rain	Several barns and other outbuildings, silos, wind- mills, and a steel grain bin demolished. Some livestock and much poultry perished. Poles and wires down. Many trees uprooted. Funnel-shaped cloud aloft observed at Tri-Mont, northwestern Mar- tin County. Heavy rains accompanied storms, which moved northeastward.
Minnesota, south- central and southwest- ern coun- ties	7-8				1	2	175,000	263,500	Rain	Excessively heavy rains that accompanied severe thunderstorms and possible tornado flooded base- ments, streets, roads, and highways. Many acres of farm lands under water. Cattle stranded in water- filled fields. Many motorists stranded along high- ways. Some small rivers and creeks overflowed their banks and more than 100 persons evacuated from their

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Minnesota, south- central and southwest- ern coun- ties (Cont'd.)	7-8									homes. Some livestock drowned. Traffic of all kinds delayed. Railroad tracks, bridges, and culverts washed out. 13 cars of freight train plunged into Wantonwan River when trestle washed out. Much damage to growing crops and some replanting necessary. Considerable soil erosion. At St. James, 6.10 inches of rain fell.
Hooper (near), Nebr.	7	7 p.m.	Nar- row		0	4	Heavy	Little	Tornado	Set of farm buildings (except house) destroyed.
Burt County and adja- cent por- tions of Washington County, Nebr.	7	Evening					Several thousand	Little	Wind	Severe damage to shade trees. Moderate but wide-spread damage to buildings and telephone and electric wires.
Minnesota, southeast- ern coun- ties	7-8	P.m. and a.m.				2	\$3,000		Electri- cal	A number of places struck by lightning. A home partly destroyed by fire. 2 men injured when struck by lightning at Minnesota transfer railroad yards. Horse killed by lightning in vicinity of Mora.
Rush and Barton Counties, Kans.	7	7:30-8 p.m.						\$40,000	Hail and wind	Strip of hail in Rush County about 4 miles wide extended from 1 mile south of Loretta to about 12 miles east-northeast; another strip in Barton County from west-central section northeastward. Wheat damaged extensively, up to 100 percent in some locations. Hailstones generally small, with only a few up to golf ball size, but quite destructive because of strong wind. Estimated damage is for Rush County.
Iowa, south- ern portion	7	10:15 p.m.— midnight	Nar- row	100	0	0	200,000		Tornado	Funnel cloud first observed 1½ miles west of Carson, and later at 9:30 p.m. near Highland Church in Adair County where minor damage occurred. Well defined track began in extreme northeastern corner of Madison County at 10:15 p.m., from which point tornado continued intermittently on ground in east-northeastward direction south of Des Moines Airport, north of Prairie City, south of Newton and Grinnell, across extreme northwestern Iowa County, with final damage reported 2 miles north of Ely in southeast-ern Linn County.
Northern Marion, southern Dickinson, and western Morris Coun- ties, Kans.	7	10:45-11 p.m.			0	0	6,000	52,000	Tornado, hail, and wind	Small tornado destroyed or damaged buildings on 3 or 4 farms in 1-1/4 mile northeastward path beginning 2½ miles north and 1½ miles west of Tampa, in north-ern Marion County, and apparently dipped again 3½ miles southwest of Herington, in southeastern Dick-inson County. Buildings destroyed as whistling sound heard 9 miles northwest of Council Grove, Morris County, about 11 p.m., may have been from same tornado. Hailstones size of marbles, driven by wind, damaged crops in 1 by 10 mile strip between Tampa and point north of Herington. Property damage was by tornado. Crop damage \$50,000 by hail; \$2,000 by tornado.
Kansas City, Kans.	7	Night					3,000		Wind	Wind damaged 3 light planes at Fairfax Airport. A few trees and branches over city blown down.
Kansas City, Mo.	8	1 a.m.				1	15,000		do	House demolished, several others damaged; 3 light planes damaged at Kansas City Airport.
St. Joseph, Mo.	8	1 a.m.					5,000		do	Church in process of construction damaged.
Mora (vicin- ity of), Minn.	8	4 a.m.					500		Thunder- storm	Some damage to houses and buildings. Trees uprooted. Communication and power services disrupted. Storm moved from southwest. Heavy rains accompanied storm.
Joliet-Lock- port area, Ill.	8	5:30 a.m.	*4				20,000		do	Many trees destroyed and damaged. 2 buildings at State Penitentiary badly damaged.
Manning, S. C.	8	Afternoon			1				Electri- cal	1 person killed.
Big Springs (near), Nebr.	8	3 p.m.	30 to 150		0	0	300	Little	Tornadoes (3)	Only 1 of the 3 tornadoes struck anything of value.
Monroe Coun- ty, Mich.	8	6:25-6:32 p.m.	100 to 300	6	4	18	460,000	40,000	Tornado, later water- spout	Tornado first observed over Temperance; then it fol- lowed for 3 miles East Temperance Road to Telegraph. As it passed over U.S. 24 some cars and trucks were tossed off road. After lifting over town of Erie a 1½ mile path of destruction occurred along Substa- tion Road. In Monroe County, 15 homes destroyed and 14 damaged, while 65 farm buildings were de- stroyed and 15 damaged. The tornado was observed

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Monroe Coun- ty, Mich. (Cont'd.)	8									over Lake Erie by pilots for another 44 minutes as a waterspout, with considerable debris in air; last position reported at 7:16 p.m., about 10 miles southwest of Kingsville, Ontario.
Wood, Sandusky, Erie, Lorain, and Cuyahoga Counties, Ohio	8	7:49:30 p.m.	*1 1/4 to 1	100	17	100	\$20,000,000		Tornadoes and hail	Squall line accompanied by thunderstorms, tornadoes, and high winds passed east-northeastward during early evening hours, leaving numerous destroyed and damaged buildings and crops and many cattle killed and injured. Variable sizes of hail reported along path of tornado, a few 1 1/2 inches in diameter. Major part of damage by tornado in Cleveland area.
Livingston and Oakland Counties, Mich.	8	7:15 p.m.	100 to 300	10	0	11	502,000	\$500	Tornado and wind	Tornado reported aloft over Brighton, but did not reach ground until 7:30 p.m. when it passed over General Motors Proving Ground (about 6 miles further northeast). Path of damage extended from 5 miles west of Milford along General Motors Road to center of Milford. It traveled over ground about 35 to 40 m.p.h. 4 homes and a barn demolished, 5 stores and a post office damaged, and 24 cars crushed. 20 percent of the damage attributed to strong winds other than tornadic.
Washtenaw County, Mich.	8	7:30-8:10 p.m.	70	8	1	5	39,500	500	Tornado	Tornado traveled through open country at about 15 to 20 m.p.h. in east-northeast direction from point 5 miles northeast of Manchester to 5 miles southwest of Ann Arbor where it lifted and was last seen just north of Ypsilanti. 1/4 inch hail reported. 1 home, 3 barns, and several smaller buildings demolished.
Spruce, Mich.	8	8:08-8:12 p.m.	100	3	0	0	75,000	0	do	Tornado moved eastward, commencing 1 mile south of Spruce. Destroyed 5 barns and livestock.
Iosco Coun- ty, Mich.	8	8:20-8:40 p.m.	110 to 880	18	1	13	\$300,000		Tornado and hail	Tornado traveled northeastward from Indian Lake, where 4 members of a family died, to Lake Huron. 1/4 inch hail reported. 5 homes destroyed and 6 damaged; 6 other buildings demolished.
Flint to Lakeport, Mich.	8	8:30- 10:40 p.m.	50 yards to 1 mile	70	116	867	\$19,000,000		Tornado	Tornado began 2 miles north of Flushing and was 1/2 mile wide when it struck northern edge of Flint moving eastward down Coldwater Road with complete destruction. Funnel cloud then followed Flint River to Columbiaville. It's path is not definite east of Columbiaville. Either a new funnel formed or displacement to south took place after lifting. Path of destruction resumed at Kings Mill and on an easterly course moved to Lake Huron, passing north of Yale and between Jeddo and Lakeport. In the 3 counties affected, 386 homes destroyed and 525 damaged. Farm buildings destroyed totaled 364, while 37 damaged. Damage to homes estimated at \$2,300,000. In St. Clair County, authorities estimated loss of farm machinery at \$130,000 and to livestock, \$11,000.
Sand Point, Mich.	8	10 p.m.			0	0	0	0	do	Tornado sighted aloft.
Davies, Grundy, and Harrison Counties, Mo.	9	5 a.m.					5,000	35,000	Hail	Extensive damage to several hundred acres of growing crops; also, to roofs, windows, cars, etc.
Bennetts- ville, S.C.	9	11:30 a.m.			1				Flood	Man drowned in high water.
Hillsboro, Highland County, Ohio	9 and 10	Afternoon of 9th- morning of 10th					500	500	Electri- cal, wind, and rain	Flash rain, wind, and lightning caused considerable damage to buildings, crops, and cattle. 0.72 inch of rain fell in 45 minutes on afternoon of 9th.
Massachu- setts, southwest- ern New Hampshire, and extreme southern Vermont	9	Afternoon and evening					7,000	5,000	Electri- cal, hail, and wind	Widespread occurrence of thunderstorms attending passage of same cold front and squall line which produced tornadoes. Areas damaged by lightning, wind, and hail included the following: New Hampshire—Counties of Merrimack, Hillsboro, Sullivan and Cheshire; Vermont—eastern and southern portions of Windham County and southeastern portion of Bennington County; Massachusetts—from Franklin County diagonally across entire State, width of path ranging from 20 to 30 miles. Franklin County, Massachusetts, most severely affected area, with greatest local damage in and around Colrain where size of hailstones reportedly ranged up to 3 inches. (See following remarks).

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Petersham- Barre- Rutland- Holden- Worcester- Shrewsbury- Westboro- Fayville- Southboro, Mass.	9	3:25-4:45 p.m.	200 to 1,600	46	90	1288	\$52,143,000	\$50,000	Tornado	This tornado, one of series which also struck just south of these areas and Exeter, N. H. on this date, was most violent and destructive tornado in New England's history; and its length, width, and extent of devastation rank it among major tornadoes of record in the United States. Number of deaths and injuries and amount of damage inflicted by this storm exceed combined totals of all previous tornadoes in New England. Average rate of forward speed was 36 m.p.h. Crop damage mostly to fruit trees.
Exeter, N.H.	9	4:20 p.m.	100	1½	0	5	100,000	0	do	This tornado was second in series which also struck over central and eastern Massachusetts on this date. This "twister" was the smallest of the 3 with respect to both its length of path and extent of damage. Occurring in Jady Hill section of Exeter, storm demolished Exeter Country Club, damaged a number of homes and business establishments, and crippled utility services. Eyewitnesses described tornado as having 2 funnels, 1 of which did not quite reach surface.
Sutton- Riverdale- Bellingham- Franklin- Wrentham- Mansfield, Mass.	9	4:30-5:37 p.m.	200 to 1,200	29	0	17	671,000	10,000	do	This tornado was third in series which also struck just north of this area and at Exeter, N. H. With exception of tornado still in progress a few miles to northeast when this 1 began, its path was 1 of longest of record in New England. While this storm, too, was violent and devastating, its course was mostly over wooded areas, so that property losses did not compare with those of "Worcester" tornado. Average rate of forward speed of this tornado was 26 m.p.h. Crop damage mostly to fruit trees.
Petroleum, W. Va.	9	5:30-6:30 p.m.					2,000	1,000	Wind (freak cyclone)	Buildings, hay, and grain damaged.
Rollinsford, N. H.	9	Early evening			0	0	300	0	Tornado	An orchard and woodland, as well as small farm building, struck by a "baby" tornado. Width and length of path uncertain, but area affected quite small.
Trego Coun- ty, Kans.	9	7:30-8 p.m.	*2	12				6,500	Hail	Hailstones size of marbles covered 60 percent of ground in heavier areas of strip from 10 miles southeast of Collyer to just south of Wakeeney. Damage to standing wheat.
Indepen- dence, Va.	9	9 p.m.						2,500	Electri- cal	Lightning hit cow shed.
Chicago area, Ill.	10	2 a.m.					25,000		Electri- cal and rain	Heavy rain caused flooding; several fires started by lightning.
Kenton, Har- din County, Ohio	10	8 a.m.				2	500		Electri- cal	Lightning struck 2 women, 1 burned seriously. Lightning also struck a farmhouse north of city.
Jefferson County, Ky.	10	A.m.					5,000		Wind	Many trees uprooted and utility wires cut by falling limbs. 1 home and several automobiles damaged by falling limbs.
Kentucky, central portion	10				1	2	6,000		do	Winds up to 65 m.p.h. hit area, uprooting trees, causing damage to utility and telephone lines, and razing some barns and small buildings.
Harlan Coun- ty, Ky.	10	1:30-4:30 p.m.					3,000		do	Utility lines down all over County as result of falling trees. 3 trailer houses damaged.
Perry and Letcher Counties, Ky.	10	P.m.					20,000	1,000	do	More than 22 homes damaged and many families lost household furnishings. Some corn damaged.
Greenville, Spartan- burg, and Chester Counties, S. C.	10	Afternoon					10,000	10,000	do	Many violent thunderstorms as result of passing squall lines caused numerous areas of relatively light damage.
Mendota, Va.	10	2:30-3 p.m.			0	0	Minor	Minor	Tornado	Reported by Climatological Observer.
Madison, Buncombe, Haywood, Henderson Counties, N. C.	10	3-5 p.m.				Few	10,000	10,000	Wind, rain, and hail	Most damage by wind. Trees blown down; power and telephone lines broken.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Fernandina Beach, Fla.	10								Electrical	3 houses on beach struck by lightning.
Madison County, Ind.	10				1				do	Boy killed by lightning.
Renfrow (near), Grant County to Bra- man (near), Kay County, Okla.	10	5-6 p.m.	*16	16			\$155,000		Hail and winds	Hail damage to ripened wheat estimated at \$150,000; wind damage to crops \$5,000. Storm lasted 45 minutes. Large hailstones 1 to 4 inches in diameter.
Beaver and Texas Coun- ties, Okla.	10	5:30 p.m.					\$5,000		Winds	40 to 50 insurance claims in Hooker; also 40 to 50 claims in Guymon; and 15 to 20 claims at Goodwell. Damage to roofs, plate-glass windows, and small buildings.
Etowah Coun- ty (South- side Com- munity), Ala.	10	P.m.					1,500		do	Trees uprooted; farm buildings damaged. Garage picked up by wind, blown a considerable distance and demolished, but car parked inside not scratched.
Centre, Ala.	10	6 p.m.					1,000		do	Power lines blown down; roofs damaged; TV antennae bent.
Cartersville and Alla- toona Lake, Bartow County, Ga.	10	6:30-7 p.m.					55,000		do	High winds up to 80 m.p.h. affected area 8x12 miles from Atco and Cartersville eastward across Allatoona Lake; storm moving toward south-southeast. Roofs and signboards torn loose, light buildings and sheds suffered heavy damage, and numerous trees and utility lines blown down in and near Atco and Cartersville. Severe damages in Allatoona Lake Area, principally at 3 boat landings; approximately 100 yachts and boats sustained moderate to heavy damages, with most of docks and piers destroyed, also a number of boathouses and other buildings.
Windham, Mont.	10	6:30 p.m.	*1½ to 2	8 to 10				Some	Hail and wind	About \$100 property damage from wind.
Stanford, Mont.	10	7 p.m.	*2	50				Some	Hail	About 30 percent damage to grain and hay.
Danvers, Mont.	10	7 p.m.	*2	12				50,000	do	
Atlanta, Ga.	10	7 p.m.				3	3,000		Wind	Considerable miscellaneous light to moderate damages in scattered areas of Atlanta. Portion of grandstand roof at Lakewood Park wrecked. Numerous trees and utility lines blown down in Grant Park, Jonesboro, Dunham Park, Chamblee, and Lakewood Park sections; several cars and other property damaged by falling tree limbs.
Madison, Ga.	10	7-8:30 p.m.					2,500		do	Severe thunderstorm accompanied by high winds and light hail. Large number of homes and other buildings suffered light to moderate damages, mostly to roofs and mostly from falling trees or falling tree limbs. Storm moved eastward.
Tallassee, Ala.	10	7 p.m.					10,000		do	Trees uprooted; power lines down; screen blown away from drive-in theatre at Carville; 2 automobiles destroyed.
Montgomery County, Ala.	10	7 p.m.					2,500		do	Wind gusts 70 m.p.h. at Dannelly Field Control Tower; part of hangar ripped off.
Troy, Ala.	10	8 p.m.					500		do	Trees uprooted; TV antennae blown down.
Hilger, Mont.	10	8 p.m.	*3	20			Consider- able	Severe	Hail and rain	Windows broken; bridges washed out; wheat and hay damaged.
Baudette and vicinity, Minn.	11	1:45 p.m.	*6	35			2,200	200	Hail	Moderate to heavy hail that accompanied a severe thunderstorm caused considerable damage to real property and some damage to growing crops. Some hailstones measured an inch in diameter. Most damage at Baudette Airport to airplanes on ground. Storm moved from southwest.
Keeline, Wyo.	11	3 p.m.		8	0	0	4,000	Light	Tornado	Some buildings moved from foundations; roofs damaged.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Clay, Green, Lawrence, Independence, Jackson, White, Woodruff, Faulkner, Pulaski, Lonoke, Prairie, Saline, Garland, and Hot Spring Counties, Ark.	11	3:30-7:35 p.m.		200		4	\$200,000	\$25,000	Wind and hail	Series of severe wind and thunderstorms progressed southwestward from Piggott in eastern Clay County over wide, irregular path to Hot Springs in Garland County and Malvern in Hot Spring County. Storms first reported at Piggott at 3:30 p.m., reached Searcy at 5:30 p.m., Little Rock at 6 p.m., and Malvern at 7 p.m. Duration of storms at points along path approximately $\frac{1}{2}$ hour. Principal wind damage at Piggott where losses totaled \$80,000. Damage in most areas confined to roofs, windows, signs, and shade trees. Hail in eastern Clay County caused crop damage of \$25,000.
Ozark, Ark.	11	P.m.					1,000		Wind	Winds accompanying local thunderstorm destroyed hangar at Ozark Airport. Planes stored in hangar undamaged.
Austin, Tex.	11	4 p.m.					100,000		do	Damage to roofs, electric wiring, and stock of furniture on Dallas highway. Peak gust of 58 m.p.h. at airport.
Dona Ana County, N. Mex.	11							100,000	Hail	Damage confined primarily to cotton and alfalfa.
Idaho, southwestern counties	12	Afternoon					Unknown	Little or none	Winds	Damage to trees and minor structural damage reported from Mesa, Centerville, Grand View, and west of Boise. Reports of tornadic activity 8 miles west of Boise (near Ustick) investigated. No evidence of anything but straight-line southerly winds which blew down 15 to 20 trees. 2 houses suffered slight damage to roofs from falling trees.
Marshall County, W.Va.	12								Electrical	Lightning struck barn and knocked down several utility poles.
Huntington, W. Va.	12								do	Lightning struck 2 houses, setting them afire; also, damaged fire department's radio control tower.
Parkersburg, W. Va.	12	Afternoon				1	400		do	Lightning struck cornice of high school building. Man shocked by lightning striking near him. Television antennae struck, causing damage to house.
Mineral Wells, W.Va.	12	Afternoon							do	Lightning struck barn; total loss, including first cutting of hay therein. Television antennae struck, leading bolt into house where it caused small damage.
Stratford (near), Wis.	12						10,000		do	Barn struck by lightning and burned.
Dunklin County, Mo.	12	3 p.m.	*1-3/4	7			7,000	8,000	Hail, wind, electrical	Growing crops damaged extensively. 1 farm building destroyed by lightning. Other buildings damaged.
Tucson and vicinity, Ariz.	12	3:30 p.m.						600	Wind and rain	Strong winds within a radius of about 2 miles from Davis-Monthan Air Force Base unroofed several buildings, blew down a number of TV aerials and sections of drive-in fence. Some wind damage to power poles also. Wind damage \$570, rain damage about \$30.
Buffalo, Mont.	12	4-4:20 p.m.	* $\frac{1}{2}$	1 $\frac{1}{2}$			Light	Light	Hail	Some windows broken.
Lawver, Wyo.	12	5 p.m.	*1	2	0	0	2,500	5,000	Tornado and hail	Some damage to buildings by tornado, but principal damage from hail.
Chase County (north-central portion), Nebr.	12	7 p.m.	*5	20			5,000	200,000	Hail	
Granville, Person, Nash, and Vance Counties, N. C.	12-13	11 p.m., 12th-5 p.m., 13th					580,000	1,000,000	Hail, rain, and electrical	50 square miles damaged. Thunderstorms occurred intermittently. 2 spells of hail. Washouts. Lightning fires.
Wabasha, Olmsted and Winona Counties, Minn.	13	1-2:15 a.m.	*2	60			200,000	15,000	Thunderstorms	More than 20 barns and also outbuildings, silos, and windmills demolished. A number of homes, garages, town buildings, automobiles, and farm machinery damaged. Many trees uprooted. Power and communication lines disrupted. A number of livestock and much poultry perished. Growing crops damaged. Some farms suffered loss of nearly all buildings. Storm moved from northwest. Heavy rains and hail accompanied storms.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Wabasha, Olmsted and Winona Counties, Minn.	13	1-2:15 a.m.	*2	60			\$50,000	\$150,000	Hail and rain	Moderate to heavy hail that accompanied severe thunderstorms caused considerable damage to real property and much damage to growing crops. Some hailstone reported to be size of small grapefruit. In Elgin area, where hailstones unusually numerous and piled up in drifts, most fields of growing crops from west of Potsdam to Little Valley either completely or partially destroyed by driving hail. Many hogs and much poultry perished. Hundreds of windows broken, roofs and sidings damaged, and automobile tops punctured. Many trees and shrubs completely stripped of leaves. Storm moved from northwest. Heavy rains that accompanied storm caused some rivers and creeks to overflow their banks. Also, considerable additional damage from heavy rains to furniture and merchandise where windows broken by hailstones.
East Gains, N. Y.	13	1 a.m.					1,000		Electrical	Church steeple damaged by lightning.
Bath, N. Y.	13	1:30 a.m.	3,520	10				10,000	Hail and wind	During thunderstorm, hailstones ranging up to 1 inch in diameter damaged fruit trees, flowers, and crops. Hailstones 6 inches or more deep around houses. Wind broke power and communication lines.
Town of Sweden, N. Y.	13	2 a.m.					15,000		do	Barn and contents burned by lightning.
Caledonia, N. Y.	13						8,000		do	Barn burned by lightning.
Elba, N. Y.	13						10,000		do	Barn and contents burned by lightning.
Webbs Crossing, N. Y.	13	A.m.					5,000		do	Small barn and contents burned by lightning.
Osage, Iowa	13	2 a.m.					20,000		Hail	Severe local hailstorm. Estimated 5,000 panes of glass in business district and 4,000 panes in greenhouses broken. Included in damage are 130 stained-glass church windows.
Hammondsport, N. Y.	13	5 a.m.					50,000		Electrical	Church two-thirds destroyed by lightning.
Whiteside County to Williamson County, Ill.	13	7 a.m.	*50	325		5	500,000		Electrical and wind	Storm first reported in Whiteside County at 7 a.m., and then moved rapidly to south-southeast, reaching Mt. Vernon about 11 a.m. High winds caused considerable damage at a number of localities in storm's path. Annawan, Geneseo, Peoria, Lincoln, Clinton, Springfield, Carlinville, Vandalia, Salem, Centralia, Mt. Vernon, West Frankfort, and Marion among communities suffering damage. Lightning also set several fires.
Wisconsin, western portion	13	Morning					10,000		Thunderstorm	Barn demolished and church steeple toppled in La Crosse County.
Minnesota, extreme southeastern counties	13	A.m. and p.m.					25,000	0	Electrical	Apartment building in St. Paul damaged by fire after being struck by lightning. Barn and 3 hay stacks on farm 5 miles north of Eyota destroyed by fire. Also, a number of other places struck by lightning.
Lancaster County, Pa.	13	9-11 a.m.					°Several hundred		Rains, hail, and electrical	Series of 3 thunderstorms, between 9 and 10:15 a.m., caused lightning and fire damage in church, factory, several homes, and garage. Falling tree limbs resulted in some wire damage. Heavy rains severely washed many fields, damaged corn and tobacco, flooded roads with water and mud, and sent small streams over their banks briefly. Hail damaged crops in Landisville-New Danville section.
St. Louis, Mo.	13	11 a.m.					10,000		Wind	Widespread minor damage due to high winds during passage of squall line.
Eaton (2 miles west of), Preble County, Ohio	13	12:45 p.m.	42		0	0	20,000	500	Tornado	Funnel cloud observed by many Eaton and nearby residents. Destruction confined to empty buildings and barns. Only small area struck by storm.
Albert Lea, Minn.	13	1 p.m.			1	2			Electrical	Boy instantly killed and 2 other boys injured when struck by lightning as they were riding bicycles.
Allardt, Fentress County, Tenn.	13	Afternoon					1,000	1,000	Hail	Hailstones reported 2½ inches in diameter. Damage mostly to roofs and gardens.
Centerville, Hickman County, Tenn.	13	Afternoon					5,000		Hail and wind	Damage mostly to dwellings. Some trees blown down.
Palmetto, Bedford County, Tenn.	13	Afternoon					2,500		Wind	Several roofs damaged.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Waynesboro, Wayne County, Tenn.	13	Afternoon					\$1,000		Wind	Several roofs damaged.
Dover, Ste- wart County, Tenn.	13	2:45-3:15 p.m.					2,000		do	Some buildings damaged. A few power lines blown down.
St. George, S. C.	13	Afternoon					\$25,000		Wind and hail	Damage mostly to tobacco.
Williams, Burke, Bottineau, Renville, and McHenry Counties, N. Dak.	13	Late af- ternoon			0	0	5,000		Tornadoes, winds, and hail	2 tornado funnels observed to form north of Williston and move eastward. 1 touched ground east of town and damaged school house and township hall 12 miles east of Williston. Tornado like winds struck in Lansford-Glenburn area wrecking barn and silo on 1 farm and damaging other buildings. Windmill blown down. Minor damage also reported north of Velva. Another tornado funnel observed south of Mohall by employee of Weather Bureau Airport Station. It was small, but appeared to strike ground; lasted only a few minutes. No reports of damage received from that area. Later in evening high winds struck Lans- ford-Glenburn area. Hail broke a number of windows in Flaxton.
Franklin, Sampson, Wake, Cas- well, Dur- ham, Mont- gomery, Johnston, and Nash Counties, N. C.	13	4-6 p.m.					200,000		Rain, hail, and electri- cal	90 square miles damaged. Lightning fires.
Danville, Va.	13	4 p.m.			0	0	Minor	Minor	Tornado	Reported by Climatological Observer.
Sand Moun- tain and Fort Payne areas, Ala.	13	5:30 p.m.					20,000		Wind	Heavy damage to trees and outbuildings; drive-in theatre demolished; roofs ripped from houses; buildings damaged.
Chatham County (western portion), Ga.	13	5:30-9 p.m.	*4-5				1,000	2,600	Hail and electric cal	Heavy hail, ranging from 1/4 to 3/4 inch in diameter, fell over rather large area 10-12 miles southwest of Savannah; corn, peas and other crops badly battered with total destruction over several acres. Light- ning quite active, striking and knocking out local power line, services disrupted 9 hours. Very heavy rains accompanied storm but winds light. (Wind gust up to 85 m.p.h. in Savannah resulted in no appre- ciable damage).
Cherokee, DeKalb, and Madison Counties, Ala.	13	P.m.					5,000		Wind	Trees uprooted; TV antennae blown down.
Kentucky, western portion	13	P.m.			3	2	350,000	150,000	do	Hundreds of trees uprooted. Buildings demolished or damaged. Damage to roofs, outbuildings, and window panes in homes extensive. Power and telephone lines down. Corn and wheat fields flattened. Wind esti- mated at 50 to 80 m.p.h. Caldwell County appeared to be hardest hit.
Brunswick, Edgecombe, Duplin, Jones, Lenoir, and Wilson Coun- ties, N. C.	13	6-9 p.m.					515,000		Thunder- storms, with heavy rain and hail	100 square miles damaged.
Lafayette and vicini- ty, Ind.	13				0	0	500	0	Tornado	Unconfirmed tornado with reportedly visible funnel cloud dipped into wooded area, bowled over a number of trees, and disappeared.
Boerne, Ken- dall Coun- ty, Tex.	13	6 p.m.							Wind	Wind estimated 40 to 50 m.p.h. Trees uprooted; wires tangled; buildings unroofed.
Little River Landing, Allatoona Reservoir, Ga.	13	7-7:15 p.m.					3,000		do	High winds from northwest caused moderate to substan- tial damages to floating boat houses, boats, and fixed docks at Little River Landing at eastern end of Allatoona Dam Reservoir Area.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Atlanta and vicinity, Ga.	13	8-8:30 p.m.				2	\$13,000	Slight	Wind	Winds more or less sustained at 60 m.p.h. or more, with gusts up to 90 m.p.h. Many trees and utility lines felled over wide area, disrupting phone and electric services for a time; scattered damages to homes and other buildings, with 1 home suffering heavy damage from falling tree.
Hall County, Ga.	13	8 p.m.					10,000	Slight	do	Numerous trees and utility lines blown down in and around Gainesville, with rather heavy losses to power lines. Some damage to houseroots from falling tree limbs. Accompanying hail, measuring 1/2 to 3/4 inch in diameter in Gainesville, caused but little loss.
Martin Junior College, Weakley County, Tenn.	13-14	11 p.m.- 4:30 a.m.							do	Damage confined mostly to corn crop.
Longvalley, Washabaugh County, S. Dak.	14	4 p.m.	440	20	0	0	5,000		Tornado	Path from southeast of Longvalley to Belvidere had various small buildings destroyed during period from 4 to 5 p.m.
Cheyenne Agency, Dewey County, S. Dak.	14-15	4 p.m.- 7:30 a.m.					208,000		Rain	Severe-looking cloud at 4 p.m. on 14th brought 0.61 inch in 1/2 hour, then it rained until 7 a.m. on 15th, totaling 2.11 inches. Stock ponds, bridges, and approaches to bridges in neighboring area damaged.
Rochelle, Wyo.	14	5 p.m.	*2	7				\$2,000	Hail	
Deadwood, Lawrence County, S. Dak.	14	6 p.m.	*2	5					do	Local hailstorm south of Deadwood in Black Hills did little or no damage, although stones reached size of 3/4 inch to 1 1/2 inches in diameter.
Scotts Bluff County (northern portion), Nebr.	14	Evening					50,000	Moderate	Rain	Damage to roads and bridges.
Lower Crazy Woman Creek, Wyo.	14	9 p.m.	*1	10			Light	3,000	Hail and rain	Some damage to roads and meadows by flood water following storm.
Inman and Gramling areas, Spartanburg County, S.C.	14	Night						100,000	Wind and hail	About 100 carloads of peaches destroyed.
Osborne County, south- western portion, Kans.	14	Night					500		Electrical	Cattle belonging to at least 4 different farmers in Natoma vicinity killed by lightning strike during storm.
Miller Valley (near Prescott), Ariz.	15	1:15 p.m.	8	**35		2		100	Dustdevil	2 boys struck by dust devil; 1 sustained black eye, other had 2 vertebrae fractured. Dust devil struck store, doing minor damage.
Cantril (near), Van Buren County, Iowa	15						10,000		Wind	Severe wind squall demolished barn near Cantril and damaged several smaller buildings between Cantril and Milton.
New London and vicinity, Minn.	15	P.m.					100,000	250,000	Rain	Excessively heavy rains that accompanied severe thunderstorms flooded basements, streets, roads, and highways. A number of bridges and culverts washed out or damaged. Many acres of lowlands inundated. Underpass on Highway 23 at Paynesville filled up with 6 feet of water. Some small rivers and creeks overflowed their banks. Much damage to growing crops from lodging, washing, or drowning. Much soil erosion occurred. Railroad tracks washed out. At New London, 7.30 inches of rain recorded in about 4 hours. At Paynesville, more than 6 inches of rain unofficially reported.
Eureka, McPherson County, S. Dak.	15	3:35-7:30 p.m.					23,000	27,000	Rain and wind	Damage to railroad line and highways not included in damage estimate. Railroad tracks at several points, as well as 1 bridge, washed out. Wind damage extended northeast to Long Lake to Hillsvie, south of Eureka. Winds of 65 to 75 m.p.h. brought crops to the ground, causing a delay of 10 days to those not total loss.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Andover, Day County, S. Dak.	15	4 p.m.		4	0	0	\$3,000		Tornado	Tornado formed on east Brown County line, moved in northeasterly direction, occasionally lifting off ground, for 4 miles and dropped again, hitting barn, small buildings, and porch of house.
Axtel (south of), Nebr.	16	1:20 a.m.	*1	2 to 3			Little	\$25,000	Hail	
Gadsden, Ala.	16	8 a.m.					14,000		Wind and electrical	Several buildings set on fire by lightning.
Denver, Colo.	16	4-6 p.m.			2	6			Electrical	Storm damaged power lines and caused several fires and 2 deaths.
Norwood, Colo.	16	4:30-5 p.m.					500		Wind	Damage mainly to buildings and contents.
Calhoun, Clay, and Roane Coun- ties, W.Va.	16-17				2		139,000	11,000	Rain	Girl and woman drowned when their houses swept away by torrential rainfall. 2 houses swept away, 35 others flooded. Heavy damage to highways. A number of automobiles damaged. Several small bridges destroyed.
Nicholas County, W.Va.	16-17								Electrical and rain	2,000 acres of hay sanded. 5 cows and 13 sheep killed by lightning.
Tyler Coun- ty, W. Va.	16-17								do	5 cows killed by lightning. Gardens and cornfields badly washed.
Bluefield, W. Va.	17	4 a.m.							Electrical	Lightning struck 3 power transformers; Bluefield without electricity 'til 9 a.m.
Antonio, Colo.	17	1-2 p.m.	10	20	0	0	150	0	Twister	Large black cloud developed over town with strong cyclonic surface winds; no funnel observed. Damage limited to roofs and buildings.
Burke Coun- ty, N. Dak.	17 and 22	Afternoon					5,000	10,000	Winds and hail	High winds and hail struck Portal and Flaxton areas on these dates. 4 barns reported destroyed and several other buildings and machinery damaged. Roof blown off Burke County fair grounds grandstand. Crops damaged by hail. 1 report that about 50 adjustments had been made on hail and tornado damage due to recent storms in that area. No actual tornado reports received, however.
Avon Park, Fla.	17								Electrical	Lightning struck 4 houses during thunderstorm.
Greeley County, Kans.	17	7 p.m.					700		Wind	Local windstorm, first described as tornado, struck farm 9 miles northeast of Tribune, damaging chicken and hog houses and tearing porch from house.
Redington Beach, Fla.	18	4 a.m.			0	0	5,000	0	Water- spout	Moved in from Gulf of Mexico. Destroyed 1 home under construction and did minor damage to 2 other homes and garages.
Clearwater, Fla.	18	A.m.			0	0		3,500	Electrical	Lightning struck wire fence at Clearwater Jersey Dairy Farm killing 10 milch cows.
Ripon (near), Wis.	18	Morning					20,000		do	2 barns struck by lightning and burned.
Kress, Swisher County, Tex.	18	2 p.m.	*3	10				500,000	Wind and hail	Cotton and maize crops damaged or destroyed. Very small hail.
Bloomer (near), Wis.	18	Night					10,000		Electrical	Lightning killed 21 cows north of Bloomer.
Bridgewater, McCook Coun- ty, S. Dak.	13	11:45 p.m.	70	3	0	0	400		Tornado	Small tornado did limited damage to trees, small buildings, and crops in rural area. Storm path toward northeast.
Minnesota, southeast- ern coun- ties	19	A.m. and p.m.	*4	80		2	100,000		Thunder- storms	A number of barns, outbuildings, silos, and windmills either demolished or damaged. City and town buildings, automobiles, and airplanes on ground damaged. Power and communication lines disrupted. Many trees uprooted. At Princeton, a 100-foot flagpole was bent and antennae destroyed or damaged. At White Bear Lake about 20 small boats capsized. Some live-stock perished. Storm moved from southwest. Heavy rains and hail accompanied storms.
Forestburg, Sanborn County, S. Dak.	19	11 a.m.— noon	*1½	2			25,000	25,000	Wind and rain	This particular thunderstorm caused darkness for 30 minutes. Some evidence of hail, but none found after storm ceased. Crop damage from wind and rain. 1.56 inches of rain fell in 30 minutes at cooperative station.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Iowa, south- western portion	19						\$65,000		Wind and electri- cal	Scattered damage throughout southwestern Iowa. Dam- age to 6 farms and 1 home in area from Braddyville to New Market; church unroofed at Stratton; large barn wrecked near Liscomb; damage to 6 farms in Rippey to Beaver area; local damage near Glidden, Madrid, and Boone; large chimney near Boone struck by lightning.
Between Car- men and Da- coma Woods County, Okla.	19	12 noon- 12:45 p.m.	*2	3 to 5	0	0	4,050	\$0	Winds and torna- does	About 12 buildings destroyed or damaged on 8 farms. 2 small tornado funnels observed in one cloud about 1 mile apart. Tornado path narrow, and struck 1 farm with damage at \$1,550. Wind damage on other farms totaled about \$2,500. Accompanied by light hail; no damage by hail.
Sumner Coun- ty, Kans.	19	1:05-1:30 p.m.					10,000		Wind (tor- nadic)	Wind with tornadic characteristics struck east side of Conway Springs, in northwestern Sumner County, tearing off roofs and shingles and lifting tops of small buildings. Continuing north-northeastward storm demolished barn and windmill.
Northeastern Marion and western Morris Counties, Kans.	19	1:35 p.m.			0	0		0	Tornado	Tornado cloud observed by workers building elevator at Ramona, in northeastern Marion County, who rushed to safety before storm collapsed sidewall of eleva- tor. Damaged buildings on several farms and planes at Beechcraft plant at air base in western Morris County. Barograph trace at Herington, about 8 miles north of Ramona, resembled one at Liberal during tornado of May 28. \$7,000 property damage in addi- tion to damage to aircraft.
Rochelle, Wyo.	19	2 p.m.					Light	2,000	Hail	
Hemingford (west of), Nebr.	19	2 p.m.	Nar- row	15	0	0	1,000	Little	Thunder- storm and tor- nado (pos- sible)	
Campbell (9 miles south- east of), Nebr.	19	Afternoon	Nar- row		0	0	2,000	Little	Tornado	2 sets of farm buildings damaged.
Jackson Coun- ty (north- ern por- tion), Kans.	19	3 p.m.			0	0		0	do	Small tornado $1\frac{1}{2}$ miles west of Whiting dipped to 4 farms, destroying barn and seriously damaging another as well as several smaller buildings.
Barton Coun- ty, Kans.	19	3:30-7 p.m.					30,000		Wind	Strong winds over County damaged roofs and trees at Albert, Hoisington, Beaver, and Great Bend, with greatest damage at Ellinwood where wind became vio- lent at 5:10 p.m. for period of 3 to 4 minutes. Un- confirmed report received of funnel cloud observed at Albert, 15 miles northwest of Great Bend.
Sedgwick County, Kans.	19	Afternoon					1,000	2,200	Electri- cal	Lightning caused fire which destroyed barn and 55 tons of hay on farm southeast of Wichita.
Osborne County (eastern portion), Kans.	19	4 p.m.					500		Wind	Strong wind in the vicinity of Downs blew down trees and awnings in town and sheds and other small build- ings on nearby farms.
Lexington (5 miles east of), Nebr.	19	4:30 p.m.					500		Thunder- storm	Several small buildings overturned.
Nemaha-Brown County Line, Kans.	19	4:30 p.m.	*1 to 2	14			8,000		Wind	Strong winds, with evidence of tornadic action, did considerable damage along path beginning in Nemaha County, 11 miles southwest of Sabetha and continu- ing north-northeastward into Brown County, 3 miles northeast of Sabetha. Several barns either de- stroyed or badly damaged, and trees blown over. No funnel cloud observed.
Mitchell County, Kans.	19	4:45-5 p.m.	440	6	0	0	18,000	0	Tornado	Tornado in western Mitchell County was one of the more violent storms along squall line. In spite of heavy dust, at least 2 persons sighted funnel-shaped cloud which first struck 7 miles south of Cawker City, moved north for 3 miles, then north-northeast- ward for 3 or 4 miles. At least 8 farms received damages to barns and other structures. Debris wide- ly scattered in some instances, and damage most indicative of rotary winds after storm assumed its northeasterly direction.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Phillips and Smith Coun- ties, Kans.	19	Late af- ternoon							Wind, rain, and hail	Strong wind accompanied by some hail and rain damaged 1 to 6 buildings on each of 15 to 20 farmsteads along path beginning 5 miles south of Kirwin and extending north-northeastward into Smith County almost to Nebraska line.
Minnesota, southeast- ern counties	19	P.m.		80		2	\$15,000		Electri- cal	A number of places struck by lightning. Lightning injured a national guardsman at Camp Ripley and a woman in Minneapolis. 2 barns entirely destroyed by fire after being struck by lightning in Mora area.
Minnesota, southeast- ern counties	19	P.m.		80			500	\$9,500	Hail	Light to heavy hail accompanied severe thunderstorms. Some hailstones measured 3/4 inch in diameter. Heavy hail reported between North St. Paul and Stillwater. Storm moved from southwest.
Minnesota, central and east-central counties	19-20	P.m. and a.m.					25,000	5,000	Rain	Excessively heavy rains that accompanied severe thunderstorms caused considerable damage to growing crops, washed out roads, highways, and railroad tracks, and flooded many basements and streets. Low-lands inundated. Growing crops damaged from lodging, washing, and drowning. Some small rivers and creeks overflowed their banks. Some bridges and culverts washed out. At Long Prairie 5.75 inches of rain recorded in about 8 hours. At Moose Lake, 4.15 inches of rain fell.
Gretna (near), Nebr.	19	5 p.m.	*1	2			5,000		Thunder- storm	
Walters, Cotton County, Okla.	19	5 p.m.	200	**200			500		Wind	Freak wind of tornadic character over small area tore up several shade trees, and caused other damage.
Meridian School Com- munity (south of Duncan), Stephens County, Okla.	19	5:20 p.m.	50	1/4	0	1	300		0 Tornado	Damage to a hay barn and other buildings.
South of Chickasha, Verden, and Pocasset, Grady Coun- ty, Okla.	19	5:25-5:45 p.m.					50,000		Winds	Over wide area more than 200 damage claims. 5 barns completely demolished and many others damaged.
Chickasha (southwest of), Grady County, Okla.	19	5:30 p.m.	880	5	0	0	25,000		0 Tornado	Path northeastward cut across southwestern edge of Chickasha. Much damage to utility lines.
Cloud Coun- ty, Kans.	19	6:55 p.m.			0	0	0		0 do	Funnel cloud described as "quite large" observed aloft about 4 miles north of Concordia. Cloud moved northeastward and disappeared. At Concordia thunderstorm in progress at time.
Rabun Coun- ty, Ga.	19	7:15 p.m.								Red Cross indicates 21 homes and 48 other buildings damaged, with crop losses affecting 200 families. Further details concerning storm not yet received.
Grandfield, Tillman County, Okla.	19	7:30-9 p.m.	300	**400		2	30,000		Wind	Several plate-glass windows blown out. About a dozen houses damaged. Power lines blown down.
Warren Coun- ty, N. C.	19	8 p.m.					30,000	180,000	Hail	12 square miles damaged, mostly tobacco.
Wayne (south of), Nebr.	19	8 p.m.	Nar- row		0	0	2,500		0 Tornado	Set of farm buildings destroyed; 4 cattle killed.
Sterling, Colo.	19	Near sun- set							Heavy Hail	Storm spotted over fairly large area in southeastern Logan County.
LaGrange, N. Y.	20						8,400		Electri- cal	21 cows killed in pasture by lightning.
Titusville, Pa.	20	Afternoon					Several hundred		do	Lightning damaged a house and several television sets, burned out transformer, and blew many fuses. Power out in some sections for 4 hours.
Three Lakes (near), Wis.	20	Afternoon		Short	0	0	30,000		0 Tornado	U. S. Forest Service reported tornado destroyed about 1 million board feet of timber.
Lake Kabeto- game and vicinity, Minn.	20	4:15 p.m.	Nar- row		0	0			do	Boat lifted and outboard motor smashed; many trees uprooted; 1 cabin damaged slightly. Major damage to timber reported. Funnel-shaped cloud reported.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Minnesota, northwest- ern, cen- tral, and southwest- ern counties	20	P.m.	5	250	3		\$15,000		Thunder- storms	Buildings on several farms and lake cottages damage windows broken; sign boards demolished; communication and power services disrupted. Many trees uprooted. At Minneapolis, about 25 sailboats capsized on Lake Harriet. 3 persons drowned when their fishing boat capsized on Union Lake near Winger. Storm moved from northwest.
Centreville, Ala.	20						4,000		Wind	Trees uprooted; glass blown out of windows; several buildings partly unroofed.
Hunter Sta- tion, Mont- gomery County, Ala.	20	P.m.					1,500		do	Barn blown down; poultry killed; trees uprooted.
Wisconsin, western portion	20	Night					50,000		Thunder- storm	High winds damaged buildings, trees, and power lines in Jackson, La Crosse, and Trempealeau Counties.
Sidney (near), Nebr.	21		Nar- row	$\frac{1}{2}$	0	0	0	\$0	Tornado	Funnel cloud observed.
Fairbury (near), Nebr.	21	12-12:30 p.m.						1,000	Hail	
Holly (near), Colo.	21		*1	2				10,000	do	Storm centered about 17 miles south of Holly. Damage mostly to growing grains.
Ohio, south- eastern portion	21	Afternoon			2	4	5,000		Electri- cal	Scattered electrical thunderstorms caused 2 deaths at Coshocton, 4 injuries at Portsmouth, and property damage at Zanesville.
Parkersburg, W. Va.	21	Afternoon							Wind	Blew awning of store down and through large plate-glass window. Backstop at ball park blown down.
Harrisburg, Pottstown, Philadel- phia, and Wilkes- Barre, Pa.	21	Afternoon			8	2			Heat	One death from drowning near Pottstown, and 2 cases of prostration at Harrisburg during hot spell. 7 persons died from drowning in various swimming spots during hot spell.
Southern Cloud, southern Clay, north- eastern Ot- tawa, and northern Dickinson Counties, Kans.	21	2:30-5:30 p.m.					1,500	775,000	Hail, wind, and electri- cal	Severe wind-driven hail in thunderstorms along squall line, in hit-and-miss pattern, damaged wheat in varying amounts ranging up to 100 percent. Greatest concentration of damage was in Miltonvale area in southeastern Cloud County. Hailstones, mostly size of marbles but occasionally as large as golf balls, piled to 2 inches deep in places. Lightning struck barn in Clay County, burning it to ground. Property damage was by lightning; crop damage by hail.
Atlanta, Ga.	21	3-3:30 p.m.					8,000		Wind and electri- cal	High winds and lightning damaged or disrupted short telephone and power lines in East Point-College Park section, and numerous trees broken or blown down, 1 of which crashed onto and heavily damaged an automobile. Lightning struck and set fire to home, destroying it.
McPherson County, Kans.	21	3:27-4:15 p.m.	*5	25			60,000	40,000	Hail	Heavy hail in area from 10 miles west of McPherson southeastward to 12 miles southeast did extensive damage to wheat and other crops in rural areas and to roofs and trees in McPherson. Hailstones from $\frac{1}{2}$ inch to 2 $\frac{1}{2}$ inches in diameter covered 90 percent of ground to depth of 1 inch.
Ronda and Charleston, W. Va.	21	Late af- ternoon							Wind	Roofs and porches blown off houses. 1 car blown over a hill. Electric lines downed by high wind started 3 fires in Charleston.
Indian Rocks Beach, Fla.	21				0	0	0	0	Water- spout	Drifted along beach then dissipated.
St. Peters- burg, Fla.	21	Late af- ternoon			0	0	0	0	Water- spouts	Swept south on Tampa Bay and barely missed city of St. Petersburg. Whipped up water, but did no damage
New York, N. Y.	21	4 p.m.			3	9			Electri- cal	In the Bronx, 3 persons killed and 9 injured by lightning strikes.
Etowah Coun- ty, Ala.	21	P.m.					1,600		Wind	Many trees uprooted.
Town of Car- roll, N. Y.	21	5-6 p.m.							Rain and electri- cal	Heavy rain caused flash flooding in township of Carroll, Chautauqua County. Bridges and roads washed out, closing 6 highways. Power and communication lines knocked out and 2 cows killed by lightning. Cows valued at \$500.

See footnotes at end of table.

## SEVERE STORMS

Table 4-Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Wichita and vicinity, Kans.	21	5:45-6:50 p.m.	*4½	11					(1) Wind, and hail, tornadoes	First of 2 severe storms observed on RADAR about 60 miles west-northwest of Weather Bureau station, moved almost east until 3 to 4 miles northwest of Wichita, then turned southeastward over city, continuing southeastward for at least 60 miles beyond, when power failure made RADAR useless. As storm passed over, gusty winds gradually worked up to 100 m.p.h. or more. Wind and hail came largely from east. Hailstones up to 1½ inches in diameter fell at airport and as large as tennis balls downtown, all sizes falling at same time. Damaged area began about 10 miles northwest and extended over entire city. Corn, wheat, farm homes, and trees damaged in rural area, while all parts of city experienced severe roof and window destruction.
Wichita, Kans.	21	9:25-9:35 p.m.	*2½	5	1	94	\$ 9,000,000	\$180,000	(2) Wind	Second storm first observed on RADAR 10 to 15 miles northwest of Wichita when power restored. Wind and rain struck with sudden blast, peak wind of over 100 m.p.h. being reached almost at once, causing widespread damage over city. Trees blown over; roofs torn off; windows broken; 4 outdoor movie screens toppled. Man killed when wall fell on him, and 94 persons treated for injuries in hospitals. Several reports of funnel clouds received, but damage did not generally indicate tornadic action. 1 small funnel which touched ground in open field northeast of Wichita for a few seconds about 6:15 p.m. observed by 5 men and another observed aloft west of city at about 5:45 p.m.
Morris County, Kans.	21	Early evening	*4	15				3,000	Hail	Hailstones from 1/4 to 3/4 inch in diameter, which covered 90 percent of ground and accumulated in places to depth of 2 inches, fell from west of White City eastward. Damage to corn, wheat, and oats.
St. Albans, Vt.	21	6-6:10 p.m.		1½	0	0	800		0 Tornado	"Very black cloud with small funnel". Small tornado swept through territory near Champlain Country Club on Swanton Road, moving a 5-car garage off its foundation and unroofing barn about a mile away.
Harlan County, Ky.	21	6:30-8:30 p.m.					1,000	3,000	Wind and hail	Damage to buildings, automobiles, livestock, and crops in fields; 40 percent of damage by wind and 60 by hail.
Cowley, northeastern Sumner, and southwestern Butler Counties, Kans.	21	6:45-7:30 p.m.			0	5	292,000	90,000	Wind, hail, electrical (possible tornado)	Severe storm along squall line struck several localities within general area, including: (1) An 8- or 10-mile square area from just northeast of Winfield north and east to beyond New Salem, where strong wind with considerable evidence of tornadic action destroyed 2 homes and 25 barns, damaged many more, and injured 5 persons. (2) Small area of wind and light hail in northwestern Cowley County. (3) Heavy hail up to size of golf balls at Dexter, in east-central portion of Cowley County. (4) Hail and wind in Mulvane area of northeastern Sumner County. (5) Hail and wind in Douglass area of southwestern Butler County. Barn in Cowley County burned after being struck by lightning. Tornado funnel reported seen by 1 person in New Salem, area where wind most damaging. Property damage was by wind. Crop damage \$40,000 by wind; \$50,000 by hail.
Guilford, Forsyth, Surry Counties, N. C.	21	7 p.m.					2,000	50,000	Hail	5 square miles damaged, mostly tobacco.
Hillsboro County, N. H., and Middlesex and Suffolk Counties, Mass.	22	Morning			2	2			0 Electrical	Violent thunderstorms swept these areas; were most severe in vicinity of Milford, N. H. Lightning disrupted utility services and started a number of fires. In Lowell, Mass., 2 boys killed and 2 others injured when struck by lightning. Estimate of property damage uncertain, but possibly between \$10,000 and \$20,000.
Honeybrook, Pa.	22	12:30-1 p.m.	15	3	0	0			Tornadoes	Several "baby tornadoes" with "funnel-shaped, black clouds" dropped suddenly a few miles east of here. They ripped off barn roof, knocked down shed, felled chimney, tore down utility lines, and damaged other farm buildings, crops and orchards.
Baltimore, Md.	22	3 p.m.					Minor		Thunder-storm	Roof and chimney damage.
Culbertson, Mont.	22	3 p.m.	*3	40				16,000	Hail	Storm about 10 miles east of Culbertson.
Dagmar, Mont.	22	5:30 p.m.	*3	12				Considerable	do	Storm 1 to 2 miles east of Dagmar, also east of Antelope and Coalridge.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
New Jersey, statewide	22	P. m.					\$5,000	\$1,000	Wind and rain	General thunderstorms resulted in sporadic damage, mostly to trees and communications and power lines.
Pottawatomie and Wabaunsee Counties, Kans.	22	7-7:30 p. m.	*4 (Pottawatomie)	8	0	0	0	65,000	Hail, wind, and tornado	In 2 areas of wind-driven hail, where stones of 1/2 to 3/4 inch in diameter covered ground to depth of 1 inch, crops damaged: (1) An 8 x 4 mile area in Pottawatomie County from 6 miles northwest of Wa- mego southeastward to 2 or 3 miles east of Wamego. (2) Small area in Wabaunsee County east and north of Alma, where wind particularly strong. Funnel cloud aloft observed in extreme northwestern Wabaun- see County by several persons. Damage by hail, \$57,500; by wind, \$7,500.
Boyd (near), Beaver County, Okla.	22	Late evening	300	1	0	0	250	0	Tornado	3 farmsteads damaged. Principal damage to wind- mill.
Gage Airport (near), El- lis County, Okla.	23	12:44- 1:15 a. m.			0	0	0	0	do	Funnel observed by CAA personnel and others. If tornado touched ground at any time, it was in open field.
Sunnyside community (3 miles south of Ponca City), Kay County, Okla.	23	1:30-5:30 a. m.	*2	1		2	2,000		Winds	Path southeastward. Some persons reported this storm a tornado.
Carthage, Mo.	23	3 a. m.					1,000		Electri- cal	5 Angus cattle killed by lightning.
Dexter, Mo.	23						3,000		do	17 Hereford cattle killed by lightning.
Froid, Mont.	23	6 a. m.	*1	12				20,000	Hail	Hailstones pea to golf ball size. Storm to east and southeast of town.
McCabe, Mont.	23	6 a. m.	*1	4 to 5				Consider- able	do	Storm 3 to 5 miles north of town. Some damage to shingles and windows.
Steelton, Pa.	23	Daytime							Electri- cal	Lightning struck church steeple, dislodging sever- al pieces of stone.
Iowa, north- central portion	23								Hail	Numerous small areas including: Strip 2 miles wide by 10 miles long from Farnhamville to south of Paton; about 1/4 of Pocahontas County, with most severe damage between Palmer and Manson; strip 3 miles wide across northern Winnebago County, which included 2 miles in northern tier of counties and 1 mile in 2d tier; this strip continued about 4 miles east of Lake Mills into Worth County. Stones reported from 1 inch to size of golfballs. Damage to ripened oats most severe, with much of crop lost. Corn shredded and in some cases stalks stripped of leaves, but with some recovery expect- ed in spite of severe damage.
Eufaula, Ala.	23	P. m.					12,000		Wind	Telephone building damaged considerably; telephone and power lines blown down.
Louisville, Ky.	23	P. m.					1,500		do	Thunderstorm struck central part of city, breaking windows, toppling chimneys, and blowing down numerous trees. An automobile badly damaged by falling tree.
Lyons (east of), Greene County, Ind.	23	P. m.	*3 1/2	4 to 5			2,500	30,000	Wind, rain, and hail	Local storm with very heavy rain and hail. Bucket surveys showed up to 7.30 inches of rain fell. Hail about 3/4 inch in diameter totally destroyed crops over limited area, also stripped leaves from trees. Wind felled a few trees and caused some damage to buildings. Although fields flooded tem- porarily, little damage resulted from heavy rain.
Minnesota, south- central and southeast- ern coun- ties	23-24	P. m., 23d- p. m., 24th			1		7,500	0	Electri- cal	Boy died of burns when his home was struck by light- ning and partially destroyed by fire in village of Hayfield. Also, 2 residences in suburban Minneapolis struck by lightning, 1 of which suffered consider- able damage by fire. Barn in vicinity of Bird Is- land destroyed by fire after being struck by light- ning.
Minnesota, southeast- ern and south-cen- tral coun- ties	23-24	P. m., 23d- p. m., 24th			2		8,000	2,000	Rains	Heavy rains that accompanied severe thunderstorms flooded basements, streets, roads, and highways. The 2 fatalities resulted when motorists overturned in water-filled ditches near Crosby and Austin.

See footnotes at end of table.

## SEVERE STORMS

JUNE 1953

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
orsythe, Mont.	23	5-5:20 p.m.	*20	50			\$5,000		Hail and wind	Wind damage of about \$5,000 to property.
Yellowstone County, Mont.	23	6-6:30 p.m.	*5 to 10	60			Consider- able	Severe	Hail	Hailstones up to $\frac{1}{2}$ inch in diameter.
Wilbank, Grant Coun- ty, S. Dak.	23	8-9 p.m.	*1	20				\$25,000	do	Hail 1 inch in diameter accumulated to 6 inches deep. 100 percent loss to crops common in this 20-mile strip.
Lindsay, Mont.	23	8:55-9:05 p.m.	*3/4	30	0	1	50,000	0	Tornado	Considerable damage to farms outside of town of Lindsay.
Richland County, N. Dak.	23	Night	*5	6			200,000		Hail, rain, and electri- cal	30 square mile area around Lidgerwood and to north and west hardest hit, although scattered reports of damage in surrounding areas. Most buildings suf- fered damage from hail and many cars damaged. Crop losses expected to run high. Hailstones size of golf balls reported. Heavy rains flooded basements. A foundation to VFW building only partially complet- ed caved in when water overflowed from underpass. Bull reported killed by lightning and 5 flax straw stacks burned when struck by lightning.
McKinley Park, Alaska	24	A.m.					140,000		Rain and glacier melt	24-hour precipitation of 1.53 inches at McKinley Park on 23d and 24th, greatest June 24-hour precipitation recorded since 1923, which, coupled with above freez- ing temperatures extending unusually high up on the glacier accelerated melt and resulting in extensive damage to road system of Mt. McKinley National Park. East Fork River Bridge, road bed fill at Toklat River, and approaches to numerous other small brid- ges washed away, with damages estimated at \$115,000. Tourists can drive no further than Polychrome Pass and road repairs may not be completed this year. At Healy, Healy River also flooded taking out railroad grade and washing away approaches to Healy and Coal Creek bridges, amounting to about \$15,000 damage in addition to unestimated loss to Healy and Usibelli Mine operators due to temporary failure in trans- portation. Richardson Highway between Paxon and Big Delta also temporarily closed to all traffic due to high water at Donnelly and Black Rapids. Approaches to 2 bridges on Valdez Road washed out, 1 at Mile 52 and 1 at Mile 53.
Oxford (northwest of), Nebr.	24		*2 to 3	10 to 15			7,000	15,380	Hail and wind	Storm also extended into small area of southeastern Furnas County.
Iowa, central portion	24						30,000		Wind	Severe wind squalls wrecked barns and smaller build- ings at Churden, 4 miles southwest of Pomeroy, near Ellsworth, north of Ralston, and 7 miles northwest of Jefferson. Damage to trees reported from Denis- on, Mapleton, Ogden, near Nevada, and in Ft. Madis- on. Falling trees interrupted telephone and elec- tric services and damaged a few automobiles.
Jackson (2 miles south- east of), Madison County, Tenn.	24	2:30-3:30 p.m.					2,000		Hail and wind	Roofs and windows damaged. Some trees uprooted.
Lenoir and Sampson Counties, N. C.	24	3 p.m.						10,000	Hail	10 square miles damaged.
Woods Coun- ty, Okla.	24	Late af- ternoon					1,000		Winds	Damage to several buildings and windmills in several communities.
Meade Coun- ty, Kans.	24	4 p.m.			0	0		0	Tornado	Moving from southwest small tornado struck 7 miles southeast of Plains, damaging buildings on 3 farms and breaking off trees, some at ground level. Fun- nel not observed because of heavy dust, but roar heard.
Miller to Redfield, Hend and Spink Coun- ties, S. Dak.	24	5-6 p.m.	*2 to 3	25				40,000	Hail	Hailstones varied from golfball-size to near baseball- size. Crop damage varied from 15 to 75 percent in this area. Strong wind did not accompany storm, but roofs of buildings damaged.
Pratt Coun- ty, Kans.	24	6 p.m.	*15	18			40,000		Wind	South of Pratt, severe windstorm from southwest ac- companied dark clouds and with heavy blowing dust, demolished or damaged buildings on 6 or 8 farms, and blew in picture window of 1 farm home. Storm area extended from about 7 miles south-southwest of Pratt to about 8 miles south-southeast. Some tornadic characteristics noted.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Strandburg, Codington County, S. Dak.	24	6:50-7:05 p.m.	*8	8			\$2,000	\$50,000	Hail	Hailstorm appeared to move toward southeast; golfball-size hail fell. 400 windows broken in Strandburg. An area of 64 square miles suffered crop damage.
Taloga (in and near), Dewey Coun- ty, Okla.	24	7-9 p.m.	*6	8			2,000		Winds	Path northeastward. Damage to buildings over large area.
Lincoln, Ill.	24	7:05 p.m.				1	5,000		Wind	Wind downed many trees, damaging 2 homes and 4 cars.
Kingman County, Kans.	24	7:30 p.m.			0	0	10,000	0	Tornado	Tornado cloud, observed by several people, damaged house and other buildings on farm and blew down drive-in theatre screen $1\frac{1}{2}$ miles southeast of Kingman. Storm may have been further development of windstorm which struck south of Pratt 90 minutes earlier.
Minnesota, west-central counties	24	8-10:40 p.m.	*5	90			200,000		Thunder- storms	Many barns and also outbuildings, silos, windmills, and lake cottages demolished. Power and communication lines disrupted. Many trees uprooted. Some livestock and much poultry perished. Houses, buildings, automobiles, and farm machinery damaged. Plate-glass windows blown in. Growing crops damage. Heavy rains and hail accompanied the storms which assumed near-tornadic proportions in Willmar area. Storm moved from southwest.
Minnesota, west-central counties	24	8-10:40 p.m.	*5	90			25,000	200,000	Hail	Hail accompanied severe thunderstorms. Some hailstones in Ortonville area reported to be nearly 5 inches in circumference. In Foster township, Big Stone County, hailstones unusually numerous and ground entirely covered to depth of several inches in places. Some fields of small grains and corn a total loss. Ortonville greenhouse lost more than 650 windows. Storm moved from southwest.
Sherman Coun- ty, Kans.	24	8:45 p.m.			0	0	0	0	Tornado	Funnel cloud observed 18 miles north of Goodland, but did not touch ground and no damage resulted.
Marshall County, Kans.	24	10 p.m.							Wind	Drive-in theatre screen blown down, limbs blown off, trees uprooted, and transformers out as result of windstorm in Marysville area.
Billings (northeast of), Noble County, Okla.	24	11:30- 11:35 p.m.	10	**210	0	0	2,000	0	Tornado	Path to north. Damage to 1 farmstead 1 mile north and 3 miles east of Billings. Funnel cloud observed.
Adams County (northern portion), Nebr.	25	1-2 a.m.	*1 to 6	34			Light	500,000	Hail and wind	Damage extended eastward into northwestern Clay County.
Atlanta, Ga.	25	4-5 a.m.					7,500		Rain	Intense rainfall in southwest Atlanta produced flash flooding of numerous little creeks and flooding in low-lying streets. Several automobiles partly or wholly submerged; rushing waters entered a number of stores and residences, damaging goods and furnishings considerably. Roof of a 3-story building collapsed from weight of water on it from which water damage to goods was great. Several telephone and power cables and circuits damaged, knocking out more than 3,000 telephones and disrupting electric services. Flooding of basement floors at Grady Hospital created more of a nuisance than damage.
Allegan, Mich.	25	4:30 a.m.					2,000		Electri- cal	Lightning and resulting fire damaged a house.
Dutton, Mich.	25	5:30 a.m.					8,000		do	Large barn about a mile south of Dutton struck by lightning and burned.
Johnson Coun- ty, Kans.	25	6 a.m.			1				do	Man in Overland Park killed by lightning in his back yard.
Southern Douglas and northern Franklin Counties, Kans.	25	Early a.m.					1,000		do	3 cows near Ottawa and 4 near Baldwin killed by lightning.
Liberal, Mo.	25	9 a.m.					500		do	3 dairy cows killed by lightning.
Grand Rapids area, Mich.	25	1 p.m.					°100,000		Rain and wind	Severe thunderstorms struck Green Ridge Country Club; uprooted a dozen trees, knocked out windows, and lifted roof of bathhouse and carried it 125 feet. Falling trees damaged 2 cars. Accompanying heavy

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Grand Rapids area, Mich. (Cont'd.)	25									rain washed out parts of highways with damage following line from southwest to northeast through Kent County. Most of total damage caused by heavy rains.
Fruitland, Mo.	25	3 p.m.					\$8,000		Wind	House and barn unroofed; several other buildings damaged.
Fremont, Sandusky County, Ohio	25	Afternoon			1		500		do	Storm killed one man and downed numerous trees and power lines.
Kokomo and vicinity, Ind.	25	Afternoon				4	20,000		do	Wind blew down large circus tent during afternoon performance, injuring 4 persons. Some trees blown down. Small amount of other property damage.
Detroit area, Mich.	25	4:15-4:45 p.m.	Several miles	100	0	4	17,500	\$2,500	Wind, electrical, hail, and tornado	Strong winds turned over 1 airplane at Ann Arbor and 2 at Wings Airport, blew down trees which, in turn, damaged some cars and cut utility services in scattered localities. 1/4 inch hail reported with storm which moved from west to east. Near Wings Airport, several hundred chickens killed when wind flattened coop and shed. At Ryan, lightning struck house which burned to ground. Miscellaneous damage occurred at Willow Run Airport, Belleville, and Whitmore Lake. Tornado clouds sighted aloft, but did no damage at Bloomfield Hills, Berkley, Royal Oak, Rochester, and northwestern Detroit. 85 percent of damage from high winds, 10 percent by lightning, and 5 percent by rain.
Tuscola County, Mich.	25								Wind	15 homes demolished and 100 barns damaged.
Indianapolis, Ind.	25	P.m.					3,500		Wind and electrical	Lightning struck 2 houses. Some limbs and trees blown down. About 50 percent damage by lightning.
Rockville, Ind.	25	P.m.					5,000	5,000	Wind and hail	At least 1 large field of corn ruined by hail. Wind damaged some roofs and toppled several trees on parked automobiles.
Angola, Ind.	25						5,000		Wind	300-foot long tent, housing an exposition, blown down by wind.
Crawfordsville, Ind.	25						5,000		do	Power lines and some trees down.
Lake County, Ind.	25				1				Electrical	Man struck by lightning as he sought shelter under a tree.
Bristol, Ind.	25						100,000		do	Fire, attributed to lightning, destroyed Victor Coach Company.
South Bend-Mishawaka area, Ind.	25	12:27 p.m. to midnight					4,500		Wind and electrical	Damage about 20 to 25 percent by lightning. Homes damaged by falling trees, TV antennae twisted, etc.
Allen County, Kans.	26	2:30 a.m.					2,000		Electrical	Highway construction barn with contents of truck, tools, oil, grease, and snow fence burned as result of lightning strike north of Colony.
Chester, Mont.	26		* 1/2	15				Considerable	Hail	Hailstones size of walnuts. Damage to wheat, oats, barley, flax, and rye. Storm south of Chester.
Rudyard, Mont.	26	12:30-12:50 p.m.	* 2	20				Considerable	do	Up to 70 percent damage to wheat in a few places. Hailstones size of marbles.
Brady (Aznoe), Mont.	26				1			Little	Hail and electrical	Lightning struck and killed a man who was operating a tractor.
Caruthersville, Mo.	26	1 p.m.					600		Electrical	Poultry house destroyed by lightning.
Lock Haven, Pa.	26	Afternoon					Several thousand		Winds	Sudden severe 5- to 8-minute thunderstorm at 1:45 p.m., with winds of 40 to 50 m.p.h. caused much tree and wire damage. Fallen trees damaged several houses and parked cars, and blocked many streets. A second thunderstorm about 4 hours later caused additional damage.
Bynum (4 miles south-south-east of), Mont.	26	2 p.m.	* 1					Slight	Hail	Hailstones up to 3/8 inch.
Valley County, Mont.	26	2 p.m.		20				Considerable	do	10 to 50 percent damage to crops.
Lockwood, Mo.	26						4,000		Electrical	Granary, truck, and quantity of wheat destroyed by lightning.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Mason County (north- ern por- tion), W. Va.	26	6 p.m.							Rain	Loss mostly to gardens and highways.
Forgan and Turpin com- munities, Beaver County, Okla.	26	7:30-8 p.m.	*8 to 10	20			\$5,000	\$1,000	Winds and hail	Property damage by wind to several windmills and buildings. Some hail damage to growing feed crops.
Concordia, Kans.	26	Evening					1,000		Hail	Hailstones up to 3 inches in diameter, falling for short period, damaged greenhouse and other building
Northern Clay County to south- western Washington County, Kans.	26	10-10:30 p.m.	*12	14			50,000	200,000	Wind and hail	Heavy hail damage to crops north of Clay Center and also near Clifton, and local wind damage, possibly tornadic, in rural area near Clay Center marked squall line passage. Hailstones as large as tea- cups reported near Clifton. Property damage, \$50,000 by wind; crop damage, \$200,000 by hail.
South Dako- ta, south- central and southeast- ern portions	27	3-6 a.m.							do	Widespread area from south-central to southeast re- ported light to moderate local storms of hail and wind, but no large-scale damage reported.
Minnesota, central and southern counties	27	A.m.					25,000		Electri- cal and rains	A number of places in Minneapolis-St. Paul struck by lightning, but damage minor. At Tyler, 2 large barns destroyed when 1 set afire by lightning and flames spread to other. Heavy rains accompanied storms and caused additional damage, also, high water in rivers and creeks.
Liverpool, Pa.	27	Morning				1	\$10,000		Electri- cal	Lightning fired and destroyed barn, including re- cently harvested crops.
Barnes, Cass, and Traill Counties, N. Dak.	27	Afternoon			0	0	2,500	0	Tornadoes and rain	4 tornado funnels observed near Cummings. Only 1 struck ground and it caused only minor damage. Corn crib upset and trees damaged on 1 farm and tornado went through yard of another farm without causing damage. Another tornado funnel reported southeast of Valley City, but apparently caused no damage. Heavy, flooding rains at Jamestown and Valley City flooded basements. Underpass at Jamestown flooded. 10 cars trapped in a single block in Valley City with water almost over tops of some cars.
Milwaukee, Wis.	27	Afternoon			1	3	100,000		Thunder- squall	Automobiles, signs, buildings, trees, and wires dam- aged by sudden squall. Small pleasure boats cap- sized or set adrift. Man drowned when sail boat overturned.
Iowa, southern portion	27	3:45-8:20 p.m.	100	3 to 5	1	5			Family of 4 torna- does, numerous wind squalls, and electri- cal	Tornado #1 occurred 4½ miles southwest of Adair about 3:45 p.m. Woman killed; man critically injured; 1 other man injured. 4 farms demolished, with heavy loss to livestock. Total damages about \$100,000. Tornado #2 occurred 2 miles north of Stanton about 4:45 p.m. 1 barn demolished, and buildings on 7 other farms damaged. Total damages about \$10,000. Tornado #3 occurred at 5:15 p.m. about 2 miles northwest of Indianola. One barn demolished and buildings on another farm damaged. Total damages about \$5,000. Tornado #4 occurred north of Evans in Mahaska County. Barn demolished. Damages about \$3,000. More extensive damage inflicted by series of severe wind squalls which occurred over a 30- mile wide strip extending from Montgomery and Cass Counties eastward to Muscatine and Scott Counties. Severe tree damage reported in Red Oak, Villisca, Corning, near Lenox, Creston, Osceola, Indianola, Pella, Oskaloosa, Sigourney, West Liberty, and near Muscatine. 2 persons injured at Indianola, and 1 at Ottumwa. In Indianola job of clearing broken trees and branches continued for 3 weeks after storm. Lighter damage occurred on either side of 30-mile strip, although near Mt. Vernon 7 Hereford cows killed by lightning. Falling trees in many towns broke power and telephone lines, causing wide- spread disruption of service.
Iowa, northwest- ern portion	27								Hail	Severe hailstorm over southeastern quarter of Osceola County in area about 6 miles wide and 16 miles long. Severe damage also reported over small area 3 miles southeast of Pocahontas; over strip 2 miles wide and 10 miles long in south-central Grundy County; over strip 5 miles long in South Douglas Township in Madison County where 15 farms received major damage; and over smaller areas in Mills, Montgomery, Warren and Scott Counties.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Savannah, Mo.	27						\$1,500		Electrical	7 Holstein cattle killed by lightning.
Linneus, Mo.	27					1			do	Boy knocked down and burned about the body by bolt of lightning.
Kenai Peninsula, Alaska	27									Record-high temperatures accelerated normal rate of glacier and snow melt to point where drainage systems could not handle excess water. Sterling Highway closed to passenger cars from June 27 to July 3 due to high water over road at Coopers Creek about 16 miles west of Seward Highway junction. Some damage done to road grades. Alaska Railroad trains moved cautiously in vicinity of Moose Pass where flood waters reached peak of 9 inches over rails.
Washington County, Kans.	27	4:15 p.m.						\$35,000 (hail)	Hail and wind	Several patches of hail in southern Washington County damaged wheat from 10 to 100 percent. Stones small but driven with considerable force by north wind. Storm moved from west.
Lincoln County, Kans.	27	4:30-4:45 p.m.	*4	6			100	10,000	do	Hail driven by wind fell over area in northeastern Lincoln County, destroying about 50 percent of ripe wheat. Storm moved from west and stones ranged from $\frac{1}{2}$ inch to $1\frac{1}{2}$ inches or more in diameter.
Englewood, Colo.	27	5-5:30 p.m.					2,500	500	Hail	Hailstones up to size of golf balls. Main damage to greenhouses, trees, and flowers.
Saline County, Kans.	27	5:30 p.m.					4,200	40,000	Hail, wind, and electrical	Hail and strong winds, accompanying electrical storm moving northeastward, struck southeast of Salina. Windows in cars and homes broken, and wheat destroyed. Fire caused by lightning burned chicken house, picket fence, and house trailer. Property damage by hail, \$3,500; by lightning, \$700. Crop damage, \$40,000 by hail.
Marshall County, Kans.	27	6 p.m.							Hail and wind	An area of hail and moderate wind north and east of Frankfort and another of near-tornadic winds in southwestern part of County received principal storm damage in Marshall County. Wind in latter area demolished a large barn and several sheds.
Pratt Coun- ty, Kans.	27	9 p.m.							Electrical	Clubhouse at Croft, in southwestern Pratt County, struck by lightning and burned. No contents saved.
Harvey Coun- ty, Kans.	27	9:30 p.m.							Wind	Strong winds north of Newton demolished several farm buildings and parts of others, tore limbs from trees, and broke some windows.
Comanche County, Kans.	27	Night					1,500		do	Residence in northeastern Comanche County struck by lightning and damaged by resulting fire.
Graham and Rooks Coun- ties, Kans.	28	1-2:30 a.m.	*4	30			5,000	15,000	Hail and wind	Some sections of both counties suffered hail damage during rainstorm. Heavy losses received in southwestern Graham County and in east-southeastward path from west-central Rooks County through Plainville, where stones were wind-driven. Minor damage occurred to at least 150 homes and garages in Plainville; drive-in theatre screen blown down, and in rural areas sheds and barn roofs damaged. Damage to property was by wind; to crops by hail.
Franklin County, Kans.	28	9 a.m.					1,500	1,000	Electrical	Barn with 600 bales of hay and about 800 bushels of corn burned 6 miles south and 2 miles west of Ottawa, following lightning strike.
Stockton, Calif.	28	2:30 p.m.			0	0	5,000		Whirl- wind	Severe whirlwind occurred under clear sky. Truck driver at Electric Planing Mill in Stockton reported that a dark, twisting, funnel-shaped cloud, making a noise like a jet plane diving, dipped down near him and sucked a 50- by 75-foot saw building 20 feet into the air; then lower part of building twisted and dropped to the ground, a mass of kindling; roof continued up until it hit high tension wires, breaking 60,000 and 12,000 volt lines before it dropped. A resulting short circuit in the plant caused minor fire damage.
Erie - north-east area, Pa.	28	3-4 p.m.							Hail	Hail damaged peaches, cherries, grapes, and apples in a 15-mile stretch, 2 to 4 miles south of lake shore.
Hardin Coun- ty (western portion), Ohio	28	3 p.m.							Wind	Storm leveled huge barn, burned large crude oil tank, and damaged apartment house.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Saxton, Pa.	28	4-5:30 p. m.				1	Thou- sands		Electri- cal and rain	Rain measured 4.1 inches in 1-1/2 hours. Force of water flooded scores of cellars, washed away retaining walls, and caused extensive damage to gardens and lawns. Water flowed 6 inches to 2 feet deep down highways. Lightning caused damage of \$15,000 to several homes and television sets; struck at least 12 transformers.
Helena, Mont.	28	4:45 p. m.	*1 to 2	12 to 15				\$420,000	Hail	9,000 to 10,000 acres of wheat damaged on Spokane Bench, approximately 10 miles east of Helena.
Baltimore, Md.	28	5:30-7 p. m.					\$100,000		Thunder- storm	Flooding; roof and chimney damage.
Fulton Coun- ty, N. Y.	28	7 p. m.							Rain, wind, and hail	Violent thunderstorms caused thousands of dollars damage to buildings, homes, crops, and utility lines but hail did little damage in agricultural areas.
Hilger, Mont.	28	8-8:30 p. m.	*2	7					Severe Hail	90 to 100 percent damage to some fields, no damage to others.
Alaska	28								Wind	High winds spread a brush fire in Anchorage area which burned 2 homesteads.
Hackensack and vicini- ty, Minn.	29	11:45-a.m. 12:15 p. m.	*8	15			125,000		Thunder- storm	A large lumber shed blown down; roof of schoolhouse caved in; houses and buildings damaged; many trees uprooted; communication and power lines disrupted. Storm moved from north-northwest. Heavy rains and hail accompanied storm.
Hackensack and Moose Lake (vici- nities of), Minn.	29	11:45 a. m.— 2 p. m.					5,000	25,000	Hail	Moderate to heavy hail that accompanied severe thunderstorms caused some damage to real property and considerable damage to growing crops. Some hailstones size of golf balls. In vicinity of Moose Lake hailstones numerous and ground completely covered in places. Storm moved from north-northwest.
De Pere (near), Wis.	29						2,000		Electri- cal	Lightning killed 5 cows.
Hertford County, N. C.	29	3 p. m.						6,000	Hail	1 square mile damaged.
York, Pa.	29	Evening					200,000		Electri- cal	Lightning started fire which destroyed stable, stone warehouse, and office building.
Stanford, Mont.	29	Evening	*8	30			30,000	900,000	Hail	Hailstones up to size of golf balls. Damage to 50 sections, mostly wheat.
Fergus Coun- ty, Mont.	29	7 p. m.	*1 1/2 to 7	25			Some	500,000	do	
Butler, Waukesha County, Wis.	30	Early morning					50,000		Electri- cal	Lightning started \$50,000 lumber fire.
Bruce Cross- ing, Mich.	30	7:30-7:45 a. m.					8,000		Wind	Several barns damaged.
Rudyard, Mich.	30	11 a. m.					3,000		do	2 barns damaged.
Flaxville, Mont.	30	12:30 p. m.	*5				Consider- able	Consider- able	Hail	Hailstones up to size of hens' eggs broke windows and damaged roofs.
Sheridan County (eastern half), Mont.	30	1:30 p. m.	*25	70			225,000	1,775,000	Rain and hail	Flash flood at Plentywood damaged about 30 city blocks, and drowned 2 persons. Heavy flood damage reported throughout storm area. Storm crossed into North Dakota. It appears that 2 storms joined to west of Westby, Montana. Hailstones up to size of hens' eggs.
Sedgwick (near), Colo.	30	2-6 p. m.	*4 1/2	11			500	100,500	Hail, rain, and wind	Storm area began at point 5 miles west of Sedgwick and extended 10 to 12 miles to southeast. Greater damage to crops by hail. Hailstones 1/2 to 1 inch in size and accumulated on ground to depth of 3 inches.
Broadwater (north of), Nebr.	30	2:30 p. m.	*2	2			Light	15,000	Hail	
Wisconsin, northern portion	30	Afternoon			5		450,000		Thunder- storms	Storm most severe in Sayner and Eagle River section of Vilas County, but some damage also in Oneida County. Winds of near tornadic force toppled much virgin timber and damaged many buildings in summer resort center of Wisconsin. 4 members of 1 family drowned when boat capsized in high wind. Boy killed when large tree crashed through roof of cabin.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JUNE 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Southern Divide, northern Williams, southwestern Burke, northern Mountrail, and central Ward Counties, N.Dak.	30	Afternoon and evening	*15	150			\$25,000	\$300,000	Winds, hail, and rains	This storm brought flooding rain to Plentywood, Montana, before it entered Divide and Williams Counties. Some of worst damage apparently in a strip more than 15 miles wide and 35 miles long in Divide and Williams Counties from hail and tornado-like winds. Another area of severe hail in strip about 2 miles wide and at least 20 miles long near Powers Lake. High winds occurred throughout strip, with many farm buildings destroyed or damaged. Bridges and culverts washed out on U. S. 52 and U. S. 2. 3 Great Northern passenger trains tied up in Minot due to washouts and high water. Hail damage described as complete in many areas. Some farmers said you couldn't tell wheat fields from land being summer fallowed.
Stanford (north and east of), Mont.	30	4 p.m.	*6	20			Considerable	300,000	Hail	
Toole County (southeastern portion), Mont.	30	4 p.m.	*2				2,000	120,000	do	Storm reached to Hill County line.
Valley County, Mont.	30							Considerable	do	10 to 50 percent damage to crops. Storm in same area as one on 26th.
Conrad, Mont.	30	5:15 p.m.	*4	10				Considerable	do	
Traverse City area, Mich.	30	6 p.m.			2		°100,000		Wind	2 persons drowned in Manistee River. A number of yachts and other pleasure craft beached or sunk and docks destroyed from sudden change of water level in Bay. Cherry tree limbs snapped near Antrim.
Lapeer, Mich.	30						30,000		do	7 barns flattened, and roof of house blown off.
Lake Huron, Mich.	30	P.m.			1				do	1 person drowned when boat overturned by high winds.
L'Anse-Baraga, Mich.	30						20,000		Rain	Both cities flooded as result of heavy rains. Principle loss from road damage and to property stored in basements.
Houghton Lake, Mich.	30	7:30 p.m.			4				Wind	Boat with 4 persons overturned in Houghton Lake when strong winds moved across lake.
Eben Junction, Mich.	30		330	2			30,000		do	Several barns destroyed; trees uprooted, tearing some telephone lines down.
Hilger, Mont.	30	Evening	*2	8				Considerable	Rain and hail	Most damage from heavy rain.
Winnett, Mont.	30	9 p.m.	*2					Considerable	Hail	
Rock Springs, Mont.	30	11:30 p.m.	*8 to 10	25 to 30			Considerable	100,000	do	Hailstones up to 1½ to 2½ inches.
Marshall County, W. Va.	30	During night							Electrical	1 house struck by lightning. Telephones and electric power off for a time.
Alaska									do	Lightning strikes accounted for a considerable number of fires which burned thousands of acres of forests during month.

\* Miles instead of yards.

\*\* Yards instead of miles.

° Crop damage included with other property damage.



# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

JUNE 1953

The most significant flooding during June occurred in the Missouri Basin in the Floyd River Valley in Iowa. Preliminary estimates indicate that the flood losses in the Floyd River Basin may reach 50 million dollars. There are 14 known deaths as a direct result of this flood. The 1926 flood was the largest, but the flood of 1953 produced the greatest flood loss due to the development of the Valley.

Heavy damages resulted from the flooding of Swan Creek in the Red River of the North River Basin. The flooding in the Casselton, N. Dak., area was the greatest in the memory of residents.

**HUDSON BAY DRAINAGE.**—The Red River of the North continued receding from a crest of 23.7 feet at Moorhead, Minn., on the 2nd to a stage of 12.2 feet on the 12th (4.8 feet below flood stage). Heavy rains on the 14th and 15th caused the Red River of the North to exceed flood stage again at Moorhead, Minn., on the 17th. It reached a crest of 22.8 feet on the 19th, 1.1 feet below the crest of June 1. The total rainfall ranged from 3/4 inch at Grand Forks, N. Dak., to more than 6 inches near Casselton, N. Dak., for an average of about 4 inches. Several tributaries such as Swan Creek, Rush River and the Sheyenne River also overflowed their banks. The flooding was most severe in the Casselton area where the greatest flooding in the memory of residents occurred. The greatest damage resulted to growing crops and was estimated at over 2 million dollars.

**ATLANTIC SLOPE DRAINAGE.**—Heavy rain (3-4 inches) on the 13th caused light to moderate flooding on the Neuse River in North Carolina between the 12th and 22nd. This same storm caused the Tar River to rise to within 0.5 foot of flood stage at Rocky Mount, N. C., on the 16th. Heavy rain (1.5 inches) on the 17th prolonged the flooding on the Neuse River at Goldsboro, N. C., and caused the Tar River to rise again to near flood stage. No important damage was reported.

**EAST GULF OF MEXICO DRAINAGE.**—A flash flood occurred on the Black Warrior River at Eutaw, Ala., on the morning of the 15th. A total of 4.4 inches of rain occurred between 5 a.m. and 10:30 a.m. Several hundred sheep drowned during the flood.

Runoff from antecedent May rains continued the flood over the lower Pearl River through June 5.

**UPPER MISSISSIPPI BASIN.**—There was a slight overflow of the Mississippi River in the Aitkin, Minn., district during the period from the 22nd to the 24th. A previous flood in this area terminated on June 2, and frequent thunderstorms maintained high river stages until the 20th when additional heavy showers forced the river out of its banks. The flood damages were very slight as the earlier flood had overflowed the crop lands. The river barely reached bankfull stage at Fort Ripley, 46 miles downstream from Aitkin. A localized flood, initiated by heavy showers and augmented by release of storage waters from Lac Qui Parle Reservoir, occurred in the extreme Upper Minnesota River from June 28 into mid-July with some flood damages in the Montevideo, Minn., district.

Very heavy rains fell over northwestern Iowa late on the 7th. The heaviest falls on the West Des Moines River ranged from 3.5 to 4.5 inches. The river rose rapidly, cresting at Estherville, Iowa, at 18 feet at 2:30 p.m. on the 8th. This was reported to be 33 inches higher than any

previous flood on the upper West Des Moines. In Estherville, four homes had to be evacuated as the flood waters spread across low lying portions of the town. Five other homes were damaged by the high water. The city power plant and water supply were temporarily threatened. The approaches to four bridges in the vicinity were weakened as the flood moved downstream, farmlands along the river were flooded. Damage to crops was small, since the flood soon subsided. At Emmetsburg, basements to both homes and business establishments were flooded. The bridge on Highway 18 was also flooded. Moderate rains fell over the Raccoon Basin in this storm, but additional rains fell over the Valley on the night of the 9th, with 3 to 4 inches reported over the lower Raccoon Basin. Both branches of the Raccoon rose rapidly, with the North Raccoon cresting at Jefferson on the afternoon of the 10th with a stage of 9.8 feet, and the South Raccoon cresting at Redfield about the same time with a stage of 23.1 feet. As the flood approached Des Moines low lying residential sections in West Des Moines and in southwest Des Moines were flooded, with about 40 families forced to evacuate their homes. Crest stage at the Southwest 18th Street Bridge was slightly below that of March 1951, and considerably below the maximum flood of record. Damages were relatively low for Des Moines and vicinity. South of Des Moines there was flooding of low lying agricultural land along the larger tributaries and along the main stream. Damage to crops was slight, since the flood waters soon subsided, and it was still possible to replant where necessary.

**MISSOURI BASIN.**—Recurring rains over a large area in central Montana, beginning on May 24 and culminating in a heavy storm on June 3 centered about 25 miles east of Great Falls, caused flooding along several streams in the Upper Missouri Basin. Shonkin, Mont., on the north slope of the Highwood Mountains, received 21.52 inches of precipitation in the 18 days ending June 4. Several stations reported amounts over 6 inches. The Missouri flooding was confined to the section below Holter Dam to the Fort Peck, Mont., reservoir. In the Great Falls area, flooding was more severe than during the 1948 major flood, and the area to the east of Great Falls experienced in places the most severe flooding on record — including the disastrous 1908 flood. In 1908, however, Great Falls flooding was worse. Flood damages were considerably heavier than those from the 1948 floods. Greatest damages occurred near and east of Great Falls, Mont., where road and railroad washouts, buildings destroyed, and crop and stock losses were extensive and severe. U. S. Highway 89 near Armington was closed for 2 weeks after the flood subsided, and washouts on the Great Falls-Billings line of the Great Northern Railway were numerous.

High temperatures in the mountains on June 11 caused the spring snow runoff to begin in the Yellowstone River Basin. Runoff was unusually heavy this spring and near bankfull stages were reached at Billings and Miles City, Mont. No damage was reported.

A flash flood was reported on Box Elder Creek at Plentywood, Mont., on June 30th following a heavy rain of from 2 to 5 inches in northeastern Montana and northwestern North Dakota. Box Elder Creek is a tributary of Big Muddy Creek which



JUNE 1953

drains into the Missouri River near Culbertson, Mont. Two drownings were reported in this flash flood.

A severe flash flood developed on the Floyd River in the vicinities of LeMars and Merrill, Iowa, during the early morning hours of June 8 from the torrential rains accompanying the thunderstorms during the afternoon and evening of the 7th. Rainfall over the Floyd River Basin ranged from 4 to 8 inches. A few reports from near Howarden, Iowa, to a few miles east of Sheldon, Iowa, showed more than 8 inches. Two unofficial reports, one near Ritter and another near Hospers, Iowa, indicated slightly over 11 inches of rain. This was one of the most devastating floods that ever occurred at Sioux City. The flood moved down the valley like a tidal wave at unbelievable speed. People had to be evacuated at utmost speed. Those who did not want to be evacuated had to be taken forcibly or left behind. Flood losses have not been evaluated, but it seems probable that total losses in the Floyd River flood may reach 50 million dollars, a major percentage of which occurred in Sioux City. Losses at the Stock Yards and Packing Plants alone will run into several millions. Part of the concrete channel near the mouth of the Floyd has settled or fallen into the river. Railroads, elevators, oil storage facilities, lumber yards, wholesale houses and factories have taken severe losses. Hundreds of residences were flooded. Four thousand people were temporarily homeless on the 7th and 8th. There are 11 known deaths as a direct result of the Floyd River flood. Flood losses were heavy throughout the Floyd Valley from Sioux City to the source regions near Sheldon. County highways and bridges were washed out, and Highway No. 75 was closed in the vicinity of Sioux City.

During the past 62 years, four floods of unusual magnitude have occurred on the Floyd River. They are the flood of May 18, 1892, the flood of September 18, 1926, the flood of June 7, 1934, and the recent flood of June 8, 1953. All of them have been devastating, both in the Valley and in Sioux City. Records are uncertain on the 1892 flood. However, it was a major one, as flooding reached into the business district of Sioux City and 25 lives were lost. Of the last three floods listed above, the 1926 flood appears to have been the largest, as the stage at Merrill, Iowa, was 2 feet higher than in the recent flood. Because of the development of the Valley, and the growth of Sioux City, this flood of June 8, 1953, has produced a greater flood loss.

The Floyd River flood is an impressive example of what can happen when numerous heavy thunderstorms traverse the entire length of a river valley and move along paths parallel to that valley. The thunderstorms that produced this flood reached a maximum intensity over the upper two-thirds of the Floyd Valley.

The Floyd Valley drainage area is approximately 80 air miles long. The source region of the Floyd River is in the southern part of Osceola County, and the Floyd passes through the eastern part of Sioux City to empty into the Missouri River. At its widest place, the Floyd watershed is about 22 miles wide and that is in Sioux and O'Brien Counties. The watershed narrows to about 10 miles at Merrill and 5 miles in Sioux City.

Some flooding occurred in the Elkhorn River Basin along the North Fork River from Pierce,

Nebr., southward to about 3 miles north of the City of Norfolk. This overflow was due to heavy rains (2.25 inches) which fell over the North Fork River drainage area on the night of June 6-7, and throughout the day of the 7th. The heaviest amount reported was 4.6 inches at Emerson, Nebr. Approximately 2,000 acres of land were inundated necessitating the replanting of crops.

Minor flooding occurred on the Little Blue River at Endicott, Nebr., on the 9th, due to heavy precipitation on the 7th and 8th.

**OHIO BASIN.**—A small flash flood occurred on the small stream which flows into Meadow Creek at Meadow Bridge, W. Va., on the afternoon of the 6th. The business section of the town was flooded up to 3 feet in depth. The heaviest rainfall reported during the storm was 3.1 inches at Pineville, W. Va. There was some damage to small farm bridges, gardens, and farm lands. The greatest amount of damage was to the recently completed changes made in W. Va. Route 20.

A series of flash floods occurred in Clay County in West Virginia on the 17th which sent walls of water roaring through mountain streams, bringing death to at least two persons and causing untold property loss. In addition to the deaths, houses were swept from their foundations, cars were tossed about, livestock was drowned, and communication was cut in many sections. Heavy rain began about 1 a.m. on the 17th and continued until 6 a.m. In some places, the storm lasted only 1 hour. The rain was heavy over most of southern West Virginia, with Summersville reporting 3.4 inches, the heaviest amount. The area of the heaviest rainfall appears to have been in the headwaters of Otter Creek, which flows into Elk River at Ivydale, W. Va., headwaters of Big Sandy Creek, at and above Newton, W. Va., and the headwaters of Laurel Creek.

**WHITE BASIN.**—The only flooding during the month was confined to the White River at and below Clarendon, Ark., and was due to continued high water from the previous month. The river was above flood stage at Clarendon from the beginning of the month until the 5th, and at St. Charles, until the 6th. Flood damage was negligible except for the loss of the use of lowlands adjacent to the stream for agricultural purposes.

**RED BASIN.**—The Ouachita and Black Rivers in Louisiana and the Red below Alexandria were in flood as June opened, and flood conditions continued through the 17th at Jonesville on the Black, the 22nd at Monroe on the Ouachita, and the 4th at Alexandria on the Red.

**LOWER MISSISSIPPI BASIN.**—All streams in the lower Mississippi Basin continued falling during the entire month of June. The Tallahatchie River at Swan Lake, Miss., and the Yazoo River at Yazoo City, Miss., were above flood stage at the beginning of the month, but fell steadily and were below flood stage on the 7th and 15th, respectively.

**ATCHAFALAYA BASIN.**—The Atchafalaya River exceeded flood stage at Morgan City, La., for several hours each day between the 1st and 12th, and again on the 28th due to winds and tides and the relatively high water level in the Gulf of Mexico. No damage resulted from the overflows.

**WEST GULF OF MEXICO DRAINAGE.**—All streams in flood in the beginning of the month continued falling during June. The heavy rains towards the end of the month had very little effect on the rivers due to the dry conditions that existed



# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS--Continued

JUNE 1953

during most of June.

The Rio Grande at Laredo, Tex., dried up for the first time in recorded history. There is a Mexican legend that it dried up for a couple of weeks in 1825. No flow was also reported at Eagle Pass, Tex., for most of the month.

COLUMBIA BASIN.--Mild weather and moderate precipitation (heavy in some cases) prevailed over the snowfields of the Upper Columbia Basin the last few days of May, continuing into the forepart of June. The effect of these elements on an already ripe snow pack caused an almost steady snow melt and a rather steady rise in the

middle and lower reaches of the Columbia and Lower Snake Rivers. Cool weather with freezing temperatures at the higher elevations halted the rise in headwater areas a few days prior to the middle of the month. The only flooding that resulted was on the Columbia at Vancouver, Wash., and the Willamette at Portland, Ore. Losses were very nominal. They consisted for the most part in loss of pasture, cost of removal of goods from low docks, the suspension of operation of industry such as a mill located in the river bank, and the increase in the cost of feed for livestock.

# FLOOD STAGE DATA

(All dates in June unless otherwise specified)

JUNE 1953

Table 5

River and station	Flood stage	Above flood stages -dates		Crest*	
		From--	To--	Stage	Date
HUDSON BAY DRAINAGE		Fl		Fl	
Red River of the North: Moorhead, Minn.	17	May 30 16	4 28	23.7 22.8	2 19
ATLANTIC SLOPE DRAINAGE					
Neuse:					
Smithfield, N. C.	13	12	16	17.0	14
Goldsboro, N. C.	14	16	22	16.2°	19
Kinston, N. C.	14	20	22	14.0°	21
EAST GULF OF MEXICO DRAINAGE					
Pearl:					
Bogalusa, La.	15	Apr. 26	4	20.1	May 24
Pearl River, La.	12	Apr. 29	5	16.1	May 24
MISSISSIPPI SYSTEM					
<u>Upper Mississippi Basin</u>					
Raccoon:					
Van Meter, Iowa	13	11	11	19.1	11
Des Moines:					
Des Moines, Iowa	13	11	12	16.3	12
Tracy, Iowa	14	11	14	16.1	14
Eddyville, Iowa	15	11	15	17.6	14
Ottumwa, Iowa	9	12	15	10.3	14
Mississippi:					
Aitken, Minn. "	12	22	24	12.3	23
<u>Missouri Basin</u>					
Big Sioux: Akron, Iowa	16	8	11	19.3	8
Floyd:					
Merrill, Iowa	12	7	10	18.0	11
James, Iowa	16	8	11	25.7	11
Little Sioux:					
Correctionville, Iowa	19+	10 12	10 15	20.9 22.1	10 12
Kennebec, Iowa	20	10	17	24.4	14
North Fork:					
Pierce (nr), Nebr.	12	7	9	14.0	8
Little Blue: Endicott, Nebr.	9	9	9	9.1	9
Sus: Simms, Mont.	6.5	2	6	8.3	4

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
<b>MISSISSIPPI SYSTEM (Cont'd.)</b>					
<u>Missouri Basin (Cont'd.)</u>					
Missouri:					
Rulo, Nebr.	17	22	22	17.2	22
St. Joseph, Mo.	17	10	10	17.3	10
<u>White Basin</u>					
White:					
Clarendon, Ark.	26	May 4	5	29.0	May 20
St. Charles, Ark.	25	May 5	6	27.4	May 21
<u>Red Basin</u>					
Omachita: Monroe, La.	40	May 17	22	45.9	1
Black: Jonesville, La.	50	May 17	17	54.8	May 27 & 28
<u>Lower Mississippi Basin</u>					
Tallahatchie:					
Swan Lake, Miss.	26	1	7	27.9	1
Yazoo: Yazoo City, Miss.	29	1	15	32.0	1
<u>Atchafalaya Basin</u>					
Atchafalaya:					
Morgan City, La.	6	1 28	12 28	6.7 6.1	11 28
<b>WEST GULF OF MEXICO DRAINAGE</b>					
Mormontau: Mormontau, La.	5	May 16	1	13.6	May 23
Sabine:					
Logansport, La.	25	May 3	7	36.0	May 19
Milam, Tex.	35	Apr. 30	10	47.0	May 20
Bon Wier, Tex.	17	Apr. 30	13	25.8	May 19
Neches: Evadale, Tex.	19	May 2	1	22.5°	May 25
Trinity: Liberty, Tex.	24	May 12	5	28.0°	May 22
<b>GULF OF CALIFORNIA DRAINAGE</b>					
<u>Colorado Basin</u>					
Eagle:					
Eagle, Colo.	5	11	19	5.9	14

\* Provisional

° Highest stage reported but not necessarily the crest

° Reading from USE gage



# RADIOSONDE DATA

Average monthly values

JUNE 1953

Table 20

ALBUQUERQUE, N. MEX. ( 836 MB.)					ATLANTA, GA. ( 982 MB.)					BIG SPRING, TEX. ( 922 MB.)					BISMARCK, N. DAK. ( 953 MB.)					BOISE, IDAHO ( 913 MB.)					BROWNSVILLE, TEX. (1011 MB.)					BUFFALO, N. Y. ( 990 MB.)				
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity						
SURFACE	30	1,619	26.8	23	30	309	24.1	75	30	784	31.0	32	30	505	18.4	78	30	868	17.8	55	30	7	28.2	78	30	221	18.2	77						
1,000	30	3			30	145			30	46			30	85			30	84			30	106	27.3	78	30	132								
950	30	468			30	600	23.7	68	30	517			30	533	18.7	73	30	532			30	566	24.1	76	30	576	18.6	64						
900	30	957			30	1,069	21.2	60	30	1,001	30.4	32	30	1,333	16.6	67	30	995	17.9	46	30	1,033	22.3	61	30	1,036	16.0	62						
850	30	1,469			30	1,562	17.8	68	30	1,509	24.3	35	30	1,477	13.4	67	30	1,481	14.7	41	30	1,528	20.3	46	30	1,519	13.2	60						
800	30	2,004	24.9	20	30	2,079	14.9	61	30	2,040	21.9	39	30	1,985	10.5	67	30	1,990	10.7	45	30	2,048	17.8	37	30	2,027	10.3	57						
750	30	2,568	20.3	21	30	2,629	12.1	55	30	2,597	16.9	46	30	2,528	8.0	57	30	2,527	6.5	47	30	2,605	14.6	34	30	2,567	7.6	52						
700	30	3,155	15.0	25	30	3,199	8.8	50	30	3,179	12.0	49	30	3,087	4.6	49	30	3,086	2.3	49	30	3,176	11.0	33	30	3,127	4.6	47						
650	30	3,773	9.4	30	30	3,814	5.0	48	30	3,800	8.1	37	29	3,695	1.0	38	30	3,686	-2.0	50	30	3,796	7.3	28	30	3,728	1.2	45						
600	30	4,433	3.3	37	30	4,458	1.1	45	30	4,451	3.7	33	29	4,329	-3.3	37	30	4,312	-6.2	48	30	4,443	3.4		29	4,369	-2.3	41						
550	30	5,128	-2.8	44	30	5,155	-3.2	38	30	5,154	-1.2		29	5,015	-7.6	36	30	4,989	-10.6	42	30	5,148	-		29	5,064	-6.4	36						
500	30	5,879	-8.8	48	30	5,901	-7.5	35	30	5,905	-6.1		28	5,745	-12.9		30	5,714	-15.8	36	30	5,897	-5.5		29	5,793	-11.1	31						
450	30	6,695	-14.4	45	30	6,725	-12.7		30	6,733	-11.8		28	6,544	-18.5		30	6,507	-21.4	35	30	6,723	-10.7		29	6,600	-16.3	33						
400	30	7,570	-20.3		30	7,602	-19.0		29	7,614	-18.2		28	7,408	-24.9		30	7,358	-27.6	34	30	7,611	-17.1		29	7,471	-22.6	37						
350	30	8,546	-27.4		30	8,581	-26.2		29	8,595	-25.9		28	8,364	-32.0		29	8,308	-34.5		30	8,596	-24.6		29	8,437	-29.5	37						
300	30	9,636	-35.9		30	9,677	-34.5		29	9,691	-34.5		28	9,435	-40.0		29	9,368	-42.2		30	9,697	-33.3		28	9,520	-37.7							
250	30	10,878	-45.4		29	10,925	-44.1		29	10,938	-44.4		28	10,655	-49.0		29	10,580	-49.7		30	10,949	-43.3		28	10,751	-47.0							
200	30	12,333	-55.5		29	12,385	-54.9		27	12,391	-54.5		28	12,099	-54.5		29	12,023	-52.9		30	12,409	-55.1		28	12,197	-56.4							
175	30	13,175	-59.9		29	13,227	-60.4		27	13,235	-59.8		28	12,944	-54.1		29	12,865	-52.6		30	13,248	-61.5		28	13,038	-58.9							
150	30	14,128	-64.1		29	14,176	-64.6		27	14,185	-64.9		28	13,940	-55.4		29	13,880	-53.2		30	14,186	-68.3		27	14,003	-65.9							
125	29	15,235	-67.0		29	15,280	-68.0		26	15,285	-68.8		28	15,097	-57.4		29	15,051	-54.9		30	15,258	-74.2		24	15,148	-60.7							
100	27	16,570	-69.3		26	16,616	-69.1		25	16,613	-70.7		26	16,496	-59.3		29	16,471	-56.6		30	16,549	-75.6		17	16,537	-61.0							
80	26	17,916	-65.1		21	17,948	-66.9		23	17,943	-66.8		27	17,896	-57.7		29	17,884	-57.1		30	17,852	-69.7		13	17,930	-59.5							
60	23	19,695	-59.7		20	19,710	-60.8		22	19,708	-59.9		25	19,719	-55.0		25	19,718	-54.7		30	19,592	-62.3		12	19,755	-56.9							
50	22	20,848	-57.0		18	20,848	-57.7		21	20,859	-56.7		22	20,884	-53.6		24	20,894	-53.2		10	20,730	-58.5		12	20,913	-55.1							
40	18	22,276	-53.5		15	22,266	-54.4		13	22,266	-53.3		16	22,327	-52.0		19	22,333	-51.8		7	22,144	-55.4		9	22,353	-53.3							
30	11	24,116	-50.6		10	24,108	-50.9						7	24,227	-49.5		11	24,183	-50.4						6	24,204	-50.2							

BURRWOOD, LA. (1014 MB.)					CARIBOU, ME. ( 989 MB.)					CHARLESTON, S. C. (1016 MB.)					COLUMBIA, MO. ( 985 MB.)					DODGE CITY, KANS. ( 921 MB.)					EL PASO, TEX. ( 878 MB.)					ELY, NEV. ( 807 MB.)				
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity						
SURFACE	30	3	26.9	84	30	191	14.6	70	30	13	23.1	87	30	238	26.0	65	29	792	27.4	42	30	1,195	30.6	30	1,908	18.3	24							
1,000	30	125	26.6	80	30	100			30	149	24.1	80	30	104			29	51			30	1,99			30	24								
950	30	584	24.2	73	30	541	15.2	59	30	602	22.2	71	30	562	26.4	58	29	513			30	487			30	486								
900	30	1,050	21.7	66	30	992	12.1	60	30	1,067	19.5	68	30	1,035	23.7	55	29	995	27.3	39	30	975			30	962								
850	30	1,544	18.7	62	30	1,468	9.2	60	30	1,538	16.9	65	30	1,532	20.5	53	29	1,498	24.9	38	30	1,481	29.8		30	1,456								
800	30	2,062	15.6	61	30	1,968	5.9	59	30	2,073	14.1	60	30	2,053	17.5	50	28	2,029	21.4	39	30	2,017	25.3	19	30	1,981	19.1							
750	30	2,614	12.9	49	30	2,500	2.6	59	30	2,624	11.4	52	30	2,608	14.0	46	28	2,586	17.4	40	30	2,583	20.2	22	30	2,536	14.7							
700	30	3,185	9.8	45	30	3,048	-4.5	55	30	3,190	8.0	52	30	3,180	10.3	41	28	3,169	13.0	41	30	3,166	14.8	27	30	3,109	9.5	26						
650	30	3,803	6.2	42	30	3,641	-3.3	52	30	3,805	4.3	52	30	3,799	5.9	40	28	3,789	7.8	42	30	3,789	9.1	34	30	3,722	3.9	32						
600	30	4,446	2.5	38	30	4,267	-6.7	52	29	4,447	-5.43	30	30	4,443	1.2	38	28	4,440	2.5	45	30	4,443	3.7	39	30	4,362	-1.7	36						
550	30	5,151	-1.7	33	30	4,944	-10.8	48	29	5,144	-3.2	33	29	5,141	-3.8	40	28	5,135	-3.3	45	30	5,141	-2.0	42	30	5,049	-7.2	38						
500	30	5,899	-6.4		30	5,667	-15.4	39	29	5,888	-7.8		29	5,885	-8.6	36	28	5,882	-8.7	39	30	5,891	-7.6		30	5,783	-12.7	37						
450	30	6,725	-11.7		30	6,462	-20.6	37	29	6,712	-13.3		28	6,704	-14.1		28	6,697	-14.1		30	6,711	-12.8		30	6,588	-18.5	34						
400	30	7,606	-18.1		29	7,314	-26.6	38	29	7,585	-20.0		29	7,577	-20.5		28	7,575	-20.3		30	7,592	-19.0		27	7,446	-24.9							
350	30	8,589	-25.1		28	8,264	-33.2		29	8,561	-27.2		28	8,551	-27.7		28	8,550	-27.4		30	8,571	-26.2		29	8,411	-31.7							
300	30	9,689	-33.7		28	9,319	-40.9		29	9,652	-35.4		29	9,639	-36.3		28	9,641	-35.7		30	9,664	-34.8		29	9,482	-40.1							
250	29	10,940	-43.4																															



# RADIOSONDE DATA

Average monthly values

Table 20—Continued

JUNE 1953

Standard pressure surface (mb.)	INTERNAT. FALLS, MINN. ( 969 MB.)				LAKE CHARLES, LA. (1013 MB.)				LANDER, WYO. ( 827 MB.)				LAS VEGAS, NEV. ( 931 MB.)				LITTLE ROCK, ARK. (1004 MB.)				MEDFORD, ORE. ( 970 MB.)				MERIDA, MEXICO (1010 MB.)				
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	
SURFACE	30	360	16.1	74	30	5	26.8	82	30	1,696	19.0	36	30	660	31.1	10	30	79	28.4	66	30	401	17.6	54	30	27	27.1	80	
1,000	30	90			30	121	27.2	76	30	22			30	11			30	112	28.8	63	30	136			30	114	26.7	79	
950	30	532	17.0	65	30	581	24.7	70	30	483			30	481			30	572	28.0	56	30	580	16.3	54	30	568	24.4	77	
900	30	989	14.4	65	30	1,048	21.9	67	30	960			30	961	29.3		30	1,048	24.6	58	30	1,032	12.8	59	30	1,041	21.7	78	
850	30	1,469	11.1	69	30	1,542	19.0	60	30	1,453			30	1,464	24.9		30	1,547	21.4	55	30	1,508	8.7	65	30	1,535	18.8	79	
800	30	1,972	7.9	69	30	2,061	16.3	56	30	1,977	18.7	29	30	1,991	20.2		30	2,071	18.3	49	30	2,007	4.7	70	30	2,055	15.8	76	
750	30	2,510	5.2	66	30	2,614	13.4	49	30	2,531	14.2	31	30	2,545	15.3		30	2,626	15.1	43	30	2,535	1.5	58	30	2,602	12.8	70	
700	30	3,064	2.7	57	30	3,186	10.1	44	30	3,103	9.3	35	30	3,120	10.1	22	30	3,202	11.5	41	30	3,082	1.7	54	30	3,178	9.7	62	
650	30	3,666		55	30	3,801	6.4	39	30	3,718	4.4	40	30	3,733	5.1		30	3,821	7.3	39	30	3,712	5.0	42	29	3,793	6.5	56	
600	30	4,295	- 4.0	48	29	4,450	2.5	34	30	4,357	- 1.0	43	30	4,378	1.1		30	4,470	3.0	39	30	4,294	- 8.4	37	28	4,442	2.9	53	
550	30	4,976	- 8.3	47	29	5,150	- 1.9		30	5,045	- 6.3	43	30	5,068	- 4.8		30	5,173	- 1.5		29	4,969	-12.3	35	28	5,144	- 9	46	
500	30	5,709	-13.2	43	28	5,899	- 6.5		29	5,785	-11.5	40	30	5,811	-10.1		30	5,922	- 6.2		29	5,687	-16.9	35	27	5,897	- 5.0	35	
450	30	6,511	-18.8	39	28	6,723	-12.2		29	6,593	-17.1		30	6,620	-16.1		29	6,750	-11.7		29	6,478	-22.5	33	27	6,726	-10.0		
400	30	7,371	-24.9	37	28	7,605	-18.6		29	7,458	-23.3		30	7,491	-22.6		29	7,631	-18.0		29	7,324	-28.4		26	7,616	-15.8		
350	30	8,325	-32.3		28	8,585	-25.7		29	8,420	-30.7		30	8,455	-29.6		28	8,613	-25.7		29	8,267	-35.4		25	8,607	-22.4		
300	30	9,392	-40.4		27	9,681	-34.4		29	9,495	-39.0		30	9,535	-38.0		28	9,711	-34.3		29	9,323	-42.9		23	9,720	-30.7		
250	30	10,610	-48.4		26	10,930	-42.7		29	10,721	-47.1		30	10,765	-46.7		28	10,960	-44.1		29	10,532	-49.5		23	10,988	-40.7		
200	30	12,058	-53.3		25	12,389	-54.7		29	12,176	-52.5		30	12,214	-54.9		28	12,423	-54.5		29	11,979	-52.6		21	12,469	-52.5		
175	29	12,918	-53.6		25	13,231	-60.3		28	13,044	-54.0		30	13,060	-57.8		28	13,267	-59.7		29	12,842	-52.4		18	13,309	-59.5		
150	29	13,905	-54.8		24	14,184	-65.9		28	14,030	-55.2		30	14,027	-59.6		27	14,220	-64.5		29	13,837	-52.8		15	14,258	-66.5		
125	29	15,067	-56.2		21	15,287	-70.8		28	15,187	-57.3		30	15,158	-62.4		27	15,323	-68.5		29	15,008	-54.5		15	15,343	-72.5		
100	28	16,475	-57.6		16	16,598	-73.0		27	16,592	-60.5		24	16,521	-64.7		24	16,647	-70.7		29	16,430	-56.0		11	16,634	-74.6		
80	27	17,883	-57.1		15	17,903	-70.8		26	17,984	-58.1		27	17,890	-62.3		20	17,978	-67.7		27	17,856	-56.9		8	17,947	-72.5		
60	25	19,707	-55.3		13	19,628	-63.4		23	19,811	-54.1		25	19,691	-58.2		17	19,730	-61.0		27	19,683	-55.2		5	19,666	-66.1		
40	24	20,874	-53.4		12	20,745	-60.6		24	20,984	-52.6		24	20,846	-55.6		13	20,879	-58.3		24	20,857	-53.7						
30	19	22,304	-51.5		8	22,164	-56.0		19	22,449	-50.8		20	22,278	-53.5		8	22,295	-55.1		15	22,292	-52.3						
20	12	24,204	-48.0						6	24,312	-48.5		11	24,135	-51.4						7	24,162	-50.8						
Standard pressure surface (mb.)	MIAMI, FLA. (1015 MB.)				NANTUCKET, MASS. (1014 MB.)				NASHVILLE, TENN. ( 995 MB.)				NORTH PLATTE, NEBR. ( 914 MB.)				OAKLAND, CALIF. (1015 MB.)				OKLAHOMA CITY, OKLA. ( 966 MB.)				OMAHA, NEBR. ( 977 MB.)				
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	
SURFACE	30	4	25.8	82	30	14	15.2	89	30	177	25.6	72	30	848	21.7	64	30	6	16.0	68	30	391	28.9	57	30	300	25.1	66	
1,000	30	137	25.4	79	30	135	16.7	77	30	130			30	55			30	130	14.5	67	30	80			30	91			
950	30	590	22.6	78	30	575	17.4	57	30	587	25.9	56	30	514			30	571	14.2	58	30	540	29.7	46	30	544	24.5	59	
900	30	1,057	19.9	77	30	1,035	15.0	57	30	1,059	22.6	56	30	983	22.0	56	30	1,019	13.6	44	30	1,021	27.1	44	30	1,017	21.1	58	
850	30	1,548	17.0	76	30	1,516	12.2	56	30	1,554	19.0	60	30	1,478	20.0	48	30	1,499	11.8	35	30	1,524	23.6	46	30	1,512	19.2	57	
800	30	2,063	14.0	75	30	2,022	9.2	51	30	2,073	16.1	51	30	1,998	17.4	46	30	2,004	9.5	26	30	2,050	20.5	42	30	2,031	16.6	52	
750	30	2,604	11.2	69	30	2,558	6.1	48	30	2,623	12.8	46	30	2,548	13.7	48	30	2,542	6.6		30	2,608	16.8	39	30	2,582	13.6	47	
700	30	3,179	8.1	62	30	3,116	2.9	47	30	3,194	9.3	40	30	3,123	9.9	45	30	3,099	3.2		30	3,188	12.5	37	30	3,156	9.9	44	
650	30	3,790	4.5	62	30	3,715	- 0.8	42	30	3,808	5.5	37	30	3,738	5.5	45	30	3,701	- 2		30	3,806	8.1	35	29	3,775	5.7	37	
600	30	4,435	1.0	56	30	4,349	- 4.1	34	29	4,454	1.2	37	30	4,383	-4.6	46	30	4,332	- 4.0	28	30	4,460	3.2	38	29	4,423	1.0	34	
550	30	5,125	- 2.9	50	30	5,032	- 7.8		30	5,150	- 3.4	35	30	5,075	- 5.9	46	30	5,014	- 8.6	29	29	5,161	- 1.8	37	29	5,113	- 4.0	36	
500	30	5,879	- 7.3	46	30	5,765	-12.4		29	5,896	- 8.1		30	5,816	-10.5	47	30	5,744	-13.6	29	29	5,911	- 6.9	34	29	5,861	- 9.4	34	
450	30	6,701	-12.4	40	30	6,570	-17.6		30	6,717	-13.4		30	6,629	-16.4	42	29	6,553	-18.7		29	6,735	-12.5		29	6,677	-14.9		
400	30	7,583	-18.1	41	30	7,434	-23.6		30	7,592	-19.8		29	7,493	-22.7	41	29	7,411	-25.0		29	7,613	-19.0		28	7,549	-21.2		
350	30	8,566	-25.1		29	8,393	-31.0		30	8,567	-27.0		29	8,457	-29.6		29	8,367	-32.1		28	8,597	-26.2		28	8,525	-28.3		
300	30	9,666	-33.7	43	29	9,466	-39.2		30	9,659	-35.6		28	9,536	-37.6		29	9,436	-40.2		28	9,692	-34.8		28	9,611	-36.3		
250	30	10,917	-43.7		27	10,672	-48.2		29	10,896	-45.3		27	10,768	-46.8		28	10,663	-49.1		27	10,941							



# RADIOSONDE DATA

Average monthly values

Table 20—Continued

JUNE 1953

Standard pressure surface (mb.)	SANTA MARIA, CALIF. (1006 MB.)				S. STE. MARIE, MICH. ( 989 MB.)				SPOKANE, WASH. ( 931 MB.)				SWAN ISLAND, W. I. (1012 MB.)				TACUBAYA, MEXICO ( 773 MB.)				TAMPA, FLA. (1015 MB.)				TATOOSH ISLAND, WASH. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	71	14.1	75	30	221	12.5	88	30	722	16.0	53	30	10	27.3	85	30	2,306	18.8	60	30	7	25.2	83	30	31	11.5	86
1,000	30	125	13.6	75	30	122			30	106			30	112	26.5	85	30	30			30	138	25.2	79	30	154	10.7	85
950	30	569	14.8	58	30	562	15.2	70	30	549			30	568	23.3	83	30	499			30	590	22.7	78	30	583	8.3	79
900	30	1,016	16.1	45	30	1,014	13.6	67	30	1,007	13.8	52	30	1,035	21.0	77	30	983			30	1,068	20.2	75	30	1,026	5.9	78
850	30	1,500	14.3	41	30	1,494	11.2	63	30	1,485	9.9	57	30	1,529	18.2	72	30	1,477			30	1,550	17.4	73	30	1,492	3.4	79
800	30	2,009	12.1	27	30	1,998	8.4	62	30	1,985	5.8	63	30	2,047	15.7	65	30	2,010			30	2,066	14.4	68	30	1,982		77
750	30	2,555	9.3		30	2,536	5.9	54	30	2,514	1.6	68	30	2,599	12.8	58	30	2,569	16.6	60	30	2,613	11.3	63	30	2,503	-1.8	71
700	30	3,115	6.3		30	3,091	2.9	49	30	3,062	-2.1	65	30	3,169	9.4	54	30	3,148	12.1	65	30	3,183	8.2	56	30	3,045	-4.9	66
650	30	3,724	2.7		30	3,690	-1.1	44	30	3,655	-5.6	63	30	3,785	5.6	56	30	3,769	7.3	72	30	3,799	4.8	53	30	3,629	-8.0	58
600	30	4,361	-1.2		30	4,325	-3.6	44	30	4,271	-9.2	55	30	4,431	1.5	60	30	4,420	2.6	79	30	4,441	1.2	50	30	4,242	-11.7	50
550	30	5,049	-5.6		30	5,006	-7.7	40	30	4,943	-13.6	53	30	5,127	-2.4	60	30	5,122	-2.0	78	30	5,140	-2.8	45	30	4,906	-16.0	49
500	30	5,789	-10.8		28	5,741	-12.4		30	5,657	-18.4	52	30	5,879	-6.6	61	29	5,872	-5.9	69	30	5,886	-7.1	41	30	5,614	-20.7	45
450	30	6,600	-16.6		28	6,542	-18.0		30	6,442	-24.1	51	30	6,702	-11.1	51	29	6,701	-10.5	56	30	6,712	-12.2	40	30	6,394	-25.9	42
400	30	7,465	-23.3		28	7,409	-24.0		30	7,283	-30.0	48	30	7,591	-16.9	49	29	7,590	-15.9	43	29	7,591	-18.0	39	30	7,228	-31.7	41
350	30	8,426	-31.0		27	8,371	-31.2		30	8,219	-37.0		30	8,579	-23.6	41	26	8,582	-22.8	43	29	8,575	-24.9		30	8,157	-39.1	
300	30	9,501	-39.0		27	9,445	-39.0		30	9,265	-44.9		30	9,687	-31.7		24	9,693	-30.8		29	9,677	-33.3		30	9,196	-46.4	
250	30	10,726	-47.6		27	10,671	-48.0		30	10,462	-51.8		29	10,948	-41.9		21	10,958	-41.0		29	10,931	-43.1		30	10,389	-51.0	
200	30	12,760	-56.0		27	12,716	-54.5		30	11,903	-51.7		28	12,419	-54.2		21	12,437	-53.3		28	12,395	-54.9		30	11,844	-49.2	
175	30	13,012	-58.8		26	12,969	-55.6		30	12,772	-50.1		28	13,262	-60.9		20	13,282	-60.3		28	13,235	-61.0		30	12,719	-49.2	
150	30	13,975	-60.4		26	13,947	-56.9		30	13,777	-50.9		27	14,203	-67.8		18	14,226	-67.6		28	14,179	-66.7		29	13,727	-50.0	
125	30	15,103	-62.5		25	15,095	-58.0		30	14,960	-52.1		20	15,283	-73.8		14	15,305	-74.1		28	15,270	-69.9		28	14,916	-51.2	
100	30	16,472	-64.2		25	16,494	-59.3		30	16,400	-53.2		18	16,577	-76.1		9	16,603	-78.6		26	16,588	-71.5		27	16,361	-52.5	
80	29	17,840	-62.2		24	17,891	-58.6		27	17,835	-54.7		17	17,869	-72.8		6	17,906	-72.3		22	17,914	-68.1		24	17,798	-53.7	
60	26	19,639	-57.9		23	19,704	-55.6		26	19,683	-53.3		14	19,587	-66.4						19	19,665	-62.7		17	19,646	-53.2	
50	25	20,794	-55.9		22	20,868	-53.4		25	20,860	-52.3		13	20,708	-62.0						16	20,796	-59.7		12	20,824	-51.8	
40	18	22,229	-53.8		18	22,310	-51.9		23	22,310	-51.2		11	22,108	-56.9						12	22,207	-55.2		5	22,275	-50.7	
30	5	24,073	-51.0		12	24,173	-50.6		14	24,176	-50.1		10	23,944	-52.9						8	24,066	-51.3					

VERACRUZ, MEXICO (1008 MB.)				WASHINGTON, D. C. (1007 MB.)				
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Number of observations	Dynamic height	Temperature	Relative humidity	
SURFACE	30	13	28.6	79	29	88	20.5	77
1,000	30	88	28.0	79	29	148	21.1	74
950	30	541	24.9	78	29	594	20.3	68
900	30	1,017	22.6	70	29	1,058	17.6	69
850	30	1,513	19.7	70	29	1,545	14.6	68
800	30	2,034	16.5	70	28	2,055	11.4	64
750	30	2,586	13.0	69	29	2,597	8.3	52
700	30	3,159	9.8	65	28	3,159	5.7	47
650	29	3,775	6.3	63	28	3,768	2.5	41
600	27	4,422	2.7	56	28	4,404	-1.4	37
550	26	5,123	-1.2	53	28	5,096	-5.2	34
500	24	5,876	-5.5	48	28	5,834	-10.0	
450	22	6,703	-10.3	41	28	6,649	-15.2	
400	21	7,595	-15.7		28	7,518	-21.6	
350	20	8,589	-22.5		28	8,487	-28.6	
300	20	9,702	-30.9		28	9,571	-36.8	
250	20	10,970	-40.6		28	10,806	-46.2	
200	20	12,452	-52.8		28	12,257	-55.3	
175	20	13,300	-59.6		28	13,099	-59.2	
150	20	14,248	-66.7		28	14,059	-60.6	
125	18	15,333	-73.2		26	15,186	-61.9	
100	10	16,613	-76.2		22	16,559	-63.6	
80					20	17,938	-61.6	
60					19	19,728	-59.3	
50					19	20,876	-56.5	
40					17	22,294	-53.6	
30					16	24,149	-51.2	
20					15	26,802	-45.7	
15					12	28,720	-43.5	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T.. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and

expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

# PILOT BALLOON DATA

Average monthly resultant winds

Table 21

JUNE 1953

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed				
Surface	30	165	6.5	30	236	2.3	30	51	1.5	28	160	0.5	30	318	3.9	30	123	7.8	30	232	4.1	30	278	2.1	30	162	3.9	30	216	1.0	30	241	2.4	30	194	6.7
500	30	164	7.9	30	236	2.3	30	51	1.5	28	160	0.5	30	318	3.9	30	123	7.8	30	232	4.1	30	278	2.1	30	162	3.9	30	216	1.0	30	241	2.4	30	194	6.7
1,000	30	164	7.9	30	236	2.3	30	51	1.5	28	160	0.5	30	318	3.9	30	123	7.8	30	232	4.1	30	278	2.1	30	162	3.9	30	216	1.0	30	241	2.4	30	194	6.7
1,500	30	161	7.3	30	236	2.3	30	51	1.5	28	160	0.5	30	318	3.9	30	123	7.8	30	232	4.1	30	278	2.1	30	162	3.9	30	216	1.0	30	241	2.4	30	194	6.7
2,000	30	169	7.0	30	231	4.0	28	243	1.3	18	218	4.6	30	294	1.8	19	113	3.6	21	278	9.9	26	271	7.1	23	34	1.9	22	273	3.1	30	215	2.5	30	194	6.5
2,500	27	172	7.2	30	222	3.8	25	224	3.1	14	239	6.7	27	253	3.8	17	102	4.1	18	278	11.5	23	281	9.1	20	25	2.6	17	300	3.7	30	212	2.2	30	197	6.5
3,000	25	176	6.6	30	226	4.4	21	224	6.3	13	248	8.3	25	230	6.4	16	98	3.9	18	284	12.2	22	288	10.8	17	6	4.4	16	299	4.7	30	226	2.8	30	199	6.0
4,000	23	188	4.9	30	227	6.9	18	231	11.0				25	228	10.2	13	108	4.0	13	295	12.7	14	300	11.8	16	352	6.5	14	309	7.1	30	230	4.6	25	212	8.6
5,000	22	210	4.0	28	236	8.8	15	233	15.6				25	227	13.3	12	98	5.6	11	303	15.8	13	300	14.9	13	343	5.7	10	291	6.6	28	226	5.6	21	219	13.0
6,000	20	241	3.6	26	246	10.8	13	246	19.5				22	233	15.9	10	82	5.1				11	285	15.6	12	339	5.6				27	230	6.8	16	227	17.9
8,000	10	275	3.2	21	240	14.1							17	228	21.3																23	242	9.1	13	237	24.1
10,000				19	238	16.6																									20	241	10.3	12	232	30.6
12,000				17	233	18.7																									14	250	13.0			
14,000																															11	245	13.9			

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)			Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Omaha, Nebr. (306 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed				
Surface	30	256	4.0	30	210	2.4	29	108	0.5	29	274	2.1	30	100	4.7	30	169	2.7	29	298	1.5	30	138	4.2	30	157	2.6	30	269	0.4	30	267	5.4	29	169	3.3
500	30	256	4.0	30	210	2.4	29	108	0.5	29	274	2.1	30	100	4.7	30	169	2.7	29	298	1.5	30	138	4.2	30	157	2.6	30	269	0.4	30	267	5.4	29	169	3.3
1,000	30	256	4.0	30	210	2.4	29	108	0.5	29	274	2.1	30	100	4.7	30	169	2.7	29	298	1.5	30	138	4.2	30	157	2.6	30	269	0.4	30	267	5.4	29	169	3.3
1,500	30	256	4.0	30	210	2.4	29	108	0.5	29	274	2.1	30	100	4.7	30	169	2.7	29	298	1.5	30	138	4.2	30	157	2.6	30	269	0.4	30	267	5.4	29	169	3.3
2,000	30	256	4.0	29	246	8.3	24	275	1.6	28	249	2.8	25	33	9	30	219	1.6	27	293	2.5	23	103	.9	22	41	2.5	29	251	1.9	29	308	3.6	27	213	6.0
2,500	30	251	4.2	27	260	10.0	24	310	2.5	25	227	4.8	22	6	2.0	28	261	1.5	24	263	2.4	21	348	.6	13	32	3.5	28	281	1.3	29	296	3.5	26	234	7.8
3,000	30	240	4.2	27	265	11.9	23	326	3.3	23	242	7.4	21	11	2.5	27	238	1.2	21	243	2.5	17	358	.9	12	38	4.2	25	285	2.1	29	292	4.3	25	236	9.1
3,500	30	228	6.1	26	270	13.1	21	337	3.7	22	245	10.0	19	31	2.8	27	256	2.1	20	257	3.3	16	355	2.2				24	291	2.9	27	287	4.6	25	243	10.0
4,000	27	220	9.6	21	284	15.0	17	329	3.2	13	239	12.3	14	27	3.9	21	274	3.0	19	263	6.9	13	343	1.5				20	332	4.4	27	268	7.3	22	262	11.6
5,000	25	230	12.5	15	283	16.3	14	316	4.9				11	18	5.3	20	281	4.8	18	252	9.1	11	304	1.8				19	325	7.2	26	263	10.6	18	273	12.9
6,000	23	234	16.1	13	288	20.3	13	307	6.2				11	3	2.9	16	279	6.7	14	276	12.2							16	317	5.7	25	267	14.0	16	271	14.5
8,000	17	242	23.1				11	299	9.3																			14	318	8.0	15	265	19.3	12	278	16.6

Altitude (meters) m.s.l.	Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (725 m.)			Washington, D. C. (24 m.)					
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed	
Surface	30	254	3.0	30	39	1.7	29	231	1.7	30	166	2.4	29	148	4.4	30	250	3.9	29	273	1.9	29	235	3.3	30	216	3.3	30	180	0.7			
500	30	250	3.3	30	39	1.7	29	226	1.9	30	180	3.2	29	145	5.3	29	264	2.5	29	276	2.9	29	237	3.5	30	216	3.3	30	180	0.7			
1,000	30	245	3.5	30	45	1.5	27	200	3.0	30	196	3.4	29	140	5.6	26	281	1.3	27	285	6.3	29	229	3.3	30	222	4.1	30	253	1.4			
1,500	30	228	3.6	28	206	.8	24	230	3.9	30	222	3.1	28	144	6.0	23	274	2.3	27	278	7.7	23	226	3.3	30	221	3.7	30	291	3.1			
2,000	30	214	4.5	27	221	3.7	19	263	6.5	27	254	4.3	27	149	5.9	22	256	4.0	27	280	8.6	21	215	3.2	27	218	4.1	30	303	5.1			
2,500	30	205	5.7	24	231	6.4	14	267	10.6	25	285	5.1	27	151	5.0	22	247	5.0	24	284	9.1	13	208	2.3	20	208	4.8	30	304	6.4			
3,000	30	209	6.9	23	240	8.4	13	268	12.1	22	286	6.4	27	152	4.0	22	244	6.7	22	280	11.5				13	185	5.9	30	308	7.2			
4,000	29	220	8.5	22	240	11.7				17	295	9.5	21	105	3.9	21	231	8.7	13	294	15.3							30	307	9.2			
5,000	29	226	10.1	21	252	14.8				13	298	9.5	19	75	1.7	18	226	9.2	11	290	19.7							30	305	10.7			
6,000	27	229	9.7	19	259	17.5				12	304	10.7	18	71	1.3	17	235	10.7										30	307	11.4			
8,000	23	241	13.7	10	253	23.7				14	265	1.7	17	233	14.9													30	309	12.7			
10,000	16	235	16.7							10	271	5.7	10	236	18.8													29	310	15.2			
12,000																												28	312	15.0			
14,000																												27	309	16.5			
16,000																												26	303	11.7			



# RAWIN DATA

Average monthly resultant winds

Table 22

JUNE 1953

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)			
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed				
Surface	30	149	3.3	30	164	5.3	30	124	1.1	30	122	6.8	30	158	1.4	30	224	2.0	30	161	1.4	30	126	2.5	30	164	1.0	30	185	0.7	30	138	1.6	30	233	0.4	
500	—	—	—	—	—	—	—	—	—	30	133	9.3	30	113	3.3	30	247	3.9	30	161	3.9	30	151	4.8	—	—	—	—	30	193	2.4	29	182	2.8	30	230	1.0
1,000	—	—	—	—	—	—	—	—	—	30	136	8.1	30	92	4.2	30	277	5.3	30	125	2.5	30	191	6.0	—	—	—	—	30	216	1.6	29	205	1.6	30	250	2.2
1,500	—	—	—	—	—	—	—	—	—	30	168	9.5	30	73	5.4	29	298	6.2	30	83	1.8	30	214	6.5	30	181	1.2	30	303	1.4	29	286	1.1	27	254	2.7	
2,000	30	189	5.1	30	168	8.0	30	245	4.8	30	129	5.2	30	67	5.5	29	295	8.0	29	54	1.7	30	225	6.4	30	222	4.9	30	323	2.7	28	319	2.1	27	266	4.6	
2,500	30	211	6.0	30	178	6.1	30	261	6.5	30	122	4.0	30	68	5.7	29	296	8.4	29	25	1.8	30	238	6.2	30	227	6.4	30	329	2.9	29	317	2.5	26	277	5.7	
3,000	30	217	6.8	30	186	3.9	30	267	8.4	30	107	3.5	30	65	5.6	29	299	8.3	29	15	2.2	30	257	6.7	30	225	7.4	30	343	3.2	29	312	2.5	26	277	7.1	
4,000	30	237	6.3	30	251	1.5	28	271	12.4	30	94	3.7	30	68	5.7	29	284	9.6	29	354	2.7	30	279	8.6	29	223	9.0	29	338	4.5	30	315	4.1	27	277	11.2	
5,000	30	248	7.8	30	277	2.3	24	271	13.7	30	74	3.6	30	62	4.6	29	285	10.8	28	359	3.0	30	290	10.1	27	225	11.1	28	340	5.8	30	320	5.5	27	280	14.0	
6,000	30	241	9.9	30	255	3.0	23	265	16.1	30	81	4.2	30	50	3.6	29	282	12.4	28	343	5.0	29	294	9.6	25	227	15.7	27	323	6.8	29	316	7.0	24	284	16.3	
8,000	26	241	12.4	29	247	5.3	22	266	23.6	30	60	4.0	30	22	2.5	28	289	16.7	25	324	7.0	29	282	12.2	15	246	19.2	26	316	12.2	29	311	10.8	22	272	21.6	
10,000	22	244	15.1	28	243	7.2	16	260	26.9	29	29	1.7	30	347	3.0	19	275	16.0	21	317	10.1	25	282	14.7	—	—	—	—	23	325	13.6	27	314	13.1	18	263	24.5
12,000	13	247	19.1	25	249	11.8	—	—	—	27	321	3.3	28	330	4.7	17	274	13.4	21	308	14.5	22	282	17.0	—	—	—	—	23	322	16.8	25	310	13.6	13	266	26.8
14,000	—	—	—	20	245	9.6	—	—	—	24	320	1.3	27	325	5.0	16	275	12.3	21	326	15.4	19	280	19.3	—	—	—	—	19	317	14.0	21	309	17.5	—	—	—
16,000	—	—	—	16	214	4.8	—	—	—	13	79	5.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13	327	13.0	17	338	8.6	—	—	—
18,000	—	—	—	13	105	5.3	—	—	—	15	82	3.9	15	295	1.4	18	42	3.5	—	—	—	—	—	—	—	—	—	—	10	343	4.9	10	14	5.0	—	—	—
20,000	—	—	—	13	88	10.9	—	—	—	15	74	6.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
22,000	—	—	—	10	91	10.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	170	2.0	30	316	3.4	30	150	1.8	29	244	3.2	30	157	0.9	30	268	5.0	30	149	6.4	30	48	2.2	30	117	6.1	30	139	2.4	30	230	0.3	30	265	4.2
500	30	183	5.0	30	318	4.1	30	147	3.9	28	262	8.2	29	149	1.5	30	282	5.1	23	150	8.3	—	—	—	30	136	9.5	29	113	7.1	29	211	1.7	30	320	5.6
1,000	30	183	4.0	30	315	4.8	30	142	3.3	28	280	6.6	29	176	1.2	30	289	4.9	23	174	12.0	30	48	2.4	30	144	9.2	29	116	7.9	28	249	4.0	30	342	5.2
1,500	30	174	2.5	30	302	3.8	30	137	3.3	28	288	6.5	30	178	1.0	30	288	4.4	23	185	10.0	30	101	1.6	30	147	5.8	29	108	7.1	28	260	5.9	30	11	4.0
2,000	30	162	1.6	30	258	2.9	30	131	2.6	28	291	6.8	30	273	1.0	30	291	4.2	23	197	7.8	30	198	2.2	30	152	3.7	29	107	6.4	29	269	7.8	30	4	3.4
2,500	30	147	.5	30	235	4.1	30	128	2.3	28	291	7.6	30	328	2.7	30	286	4.0	28	206	6.8	30	214	5.4	30	138	3.2	29	100	5.0	27	269	10.0	30	316	3.8
3,000	30	123	.1	30	242	4.8	30	123	1.5	29	288	7.3	30	335	3.9	30	273	5.4	29	218	5.4	30	227	8.1	30	127	3.5	29	95	4.3	27	271	11.2	30	291	5.7
4,000	30	9	2.2	29	246	6.6	30	99	1.8	29	285	9.1	30	331	6.1	30	260	8.2	30	243	3.3	30	244	12.2	30	76	2.6	29	78	2.4	25	272	14.2	30	265	8.1
5,000	30	347	4.1	29	250	8.6	30	80	2.0	28	282	10.3	30	327	7.6	30	252	10.4	28	286	2.5	28	252	15.9	30	57	2.6	30	302	.5	25	277	16.6	30	257	10.2
6,000	30	331	5.2	29	257	11.7	30	40	1.7	25	284	10.8	30	327	8.6	28	255	13.1	28	271	3.7	28	251	18.0	30	66	1.9	29	253	1.2	23	273	18.1	30	254	13.5
8,000	28	308	7.5	29	244	17.7	30	18	2.4	23	282	12.5	29	308	9.0	23	265	21.4	28	265	7.6	24	253	21.4	29	20	1.9	28	268	4.2	22	276	23.3	27	259	15.5
10,000	27	289	8.5	22	246	19.2	30	296	3.4	19	257	16.4	27	300	9.5	13	277	22.4	27	269	11.7	20	246	23.7	22	284	4.0	28	281	7.9	13	279	26.1	19	255	19.6
12,000	26	295	9.8	17	253	17.8	30	318	7.7	12	245	15.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14,000	25	290	12.6	10	244	10.0	29	339	7.7	—	—	—	23	317	14.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
16,000	17	294	5.4	—	—	—	20	16	7.6	—	—	—	19	339	9.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18,000	10	121	2.2	—	—	—	14	84	7.4	—	—	—	15	48	5.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20,000	—	—	—	—	—	—	10	84	10.5	—	—	—	12	83	6.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—	—	10	84	8.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D. C. 		
-----------------------------	--	--	--	-------------------------------	--	--	----------------------------------	--	--	--------------------------	--	--

# SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun.

JUNE 1953

TABLE MOUNTAIN, CALIF.									
Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
June 1	---	---	---	1.40	---	---	---	---	---
2	1.02	1.12	1.24	1.38	---	---	---	---	---
3	---	---	---	1.42	---	---	---	---	---
4	1.13	1.21	1.32	1.44	---	---	---	---	---
5	---	---	---	1.45	---	---	---	---	---
6	---	---	---	1.41	---	---	---	---	---
7	1.10	1.19	1.28	1.41	---	---	---	---	---
8	---	---	---	1.40	---	---	---	---	---
9	---	---	---	1.42	---	---	---	---	---
10	---	---	---	1.44	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---
Averages	1.08	1.17	1.28	1.42	---	---	---	---	---
Departures	-.01	-.01	.00	+.02	---	---	---	---	---

ALBUQUERQUE, N. MEX.									
Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
June 1	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---
3	0.96	1.07	1.18	1.32	---	1.10	1.21	1.04	---
4	.95	1.05	1.17	1.32	---	1.21	1.25	---	---
5	.79	.89	1.04	1.21	---	1.23	1.06	---	---
6	---	.88	1.03	1.20	---	1.22	1.01	---	0.87
7	.98	1.06	1.18	1.33	---	1.30	1.08	0.91	.83
8	.99	1.06	1.21	1.31	---	1.34	1.13	.99	---
9	.54	.66	.83	1.06	---	---	---	---	---
10	---	.91	---	---	---	---	---	---	---
11	.87	.93	1.06	1.23	---	---	---	---	---
12	.89	.98	1.11	1.25	---	1.27	1.13	.99	.93
13	---	---	---	---	---	---	---	.89	.80
14	---	---	---	---	---	---	---	.92	.85
15	.97	1.02	1.12	1.26	---	1.16	1.03	---	---
16	---	---	---	---	---	---	---	---	---
17	.87	.98	1.12	1.29	---	1.30	1.15	1.05	.98
18	.90	.99	1.11	1.26	---	1.31	1.16	1.06	.96
19	.90	.99	1.12	1.29	---	1.30	1.17	---	---
20	.88	.96	1.10	1.27	---	1.06	.61	.49	.42
21	---	---	---	1.04	---	---	---	---	---
22	---	---	---	1.23	---	1.10	---	.67	---
23	.92	---	1.15	1.30	---	1.30	1.14	1.00	.91
24	.61	.76	.89	1.10	---	1.24	1.00	---	---
25	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---
Averages	.87	.95	1.09	1.24	---	1.23	1.05	.90	.93
Departures	+.05	+.04	+.05	+.04	---	.00	-.05	-.09	+.02

BOSTON, MASS.									
Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
June 1	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---
Averages	---	---	---	---	---	---	---	---	---
Departures	---	---	---	---	---	---	---	---	---

BLUE HILL, MASS.									
Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
June 1	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---
Averages	.71	.86	.99	1.17	---	1.12	.95	.87	.76
Departures	+.05	+.10	+.09	+.11	---	+.07	+.09	+.15	+.14

MADISON, WIS.									
Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
June 1	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---
Averages	---	---	---	---	---	---	---	---	---
Departures	---	---	---	---	---	---	---	---	---

Langley is the unit used to denote one gram-calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of

pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.



# SOLAR RADIATION DATA

JUNE 1953

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

Date-----	4	5	6	7	8	9	10	Avg	11	12	13	14	15	16	17	Avg	18	19	20	21	22	23	24	Avg
Langleys-----	110	143	165	128	175	99	191	144	156	167	130	183	148	159	171	159	196	---	172	172	111	183	170	169
Date-----	25	26	27	28	29	30	1	Avg																
Langleys-----	158	140	131	159	161	177	190	159																

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

Date-----	4	5	6	7	8	9	10	Avg	11	12	13	14	15	16	17	Avg	18	19	20	21	22	23	24	Avg
Langleys-----	125	304	401	170	477	177	460	302	440	391	336	221	385	403	383	365	391	---	338	232	162	388	431	327
Date-----	25	26	27	28	29	30	1	Avg																
Langleys-----	411	290	231	350	245	377	305	316																

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

Date-----	4	5	6	7	8	9	10	Avg	11	12	13	14	15	16	17	Avg	18	19	20	21	22	23	24	Avg
Langleys-----	104	234	224	125	245	167	230	190	206	236	231	252	218	235	222	229	210	---	237	197	204	199	217	210
Date-----	25	26	27	28	29	30	1	Avg																
Langleys-----	221	242	227	239	232	244	242	235																

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

Date-----	4	5	6	7	8	9	10	Avg	11	12	13	14	15	16	17	Avg	18	19	20	21	22	23	24	Avg
Langleys-----	137	320	336	264	511	278	432	325	164	380	268	428	282	248	212	285	309	---	356	213	201	424	402	313
Date-----	25	26	27	28	29	30	1	Avg																
Langleys-----	287	300	402	364	412	386	273	346																

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

Date-----	4	5	6	7	8	9	10	Avg	11	12	13	14	15	16	17	Avg	18	19	20	21	22	23	24	Avg
Langleys-----	186	208	196	196	---	167	84	171	121	105	132	194	146	116	279	156	226	---	187	291	221	110	64	187
Date-----	25	26	27	28	29	30	1	Avg																
Langleys-----	153	173	112	122	180	161	289	170																

Note: Langley is the unit used to denote one gram calorie per square centimeter.

# SOLAR RADIATION DATA

**Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleya.**

JUNE 1953

	1953	Akivik MNT, Canada	Albuquerque, N. Mex.	Astoria, Oregon	Atlanta, Ga.	Bethel, Alaska	Big Spring, Texas	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Brownsville, Texas	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Cleveland, Ohio	Columbia, Mo.	Columbus, Ohio (U. of Ohio)	Davis, Calif.	Dodge City, Kans.	East Lansing, Mich.	East Wareham, Mass.	Edmonton, Alberta	El Paso, Texas	Ely, Nevada	Fairbanks, Alaska	Fort Worth, Texas	Fresno, Calif.	Glasgow, Mont.	Grand Junction, Colo.	Grand Lake, Colo.	Greenboro, N. C.	Griffin, Ga.	Hatties, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.
June 4-----	569	795	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 5-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 6-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 7-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 8-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 9-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 10-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
Averages-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
Departures-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 11-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 12-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 13-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 14-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 15-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 16-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 17-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
Averages-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
Departures-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 18-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 19-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 20-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 21-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 22-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 23-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 24-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
Averages-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
Departures-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 25-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 26-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 27-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 28-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 29-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 30-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
July 1-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
Averages-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
Departures-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
June 31-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
Averages-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287
Departures-----	569	829	774	569	774	274	567	165	232	511	676	623	(429)	753	641	658	756	612	451	292	268	811	799	503	--	805	775	295	642	592	737	725	715	625	779	287

Accumulated Departures January 1, 1953 to July 1, 1953

[illegible]

Note.--Langley is the unit used to denote one gram calorie per square centimeter.

Langley is the unit used to denote one value in parentheses are interpolated.

gram calorie per square centimeter.



## JUNE 1953

JUNE 1953

Accumulated Departures January 1, 1953 to July 1, 1953

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

## ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

JUNE 1953

Station	Day of month																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
Baltimore, Md.	150	—	872	758	802	814	582	357	(700)	668	846	362	—	—	820	735	—	590	—	788	825	585	(832)	—	813	825	698	549	610	842	(684)	
Philadelphia, Pa.	259	669	691	—	605	611	238	425	369	636	716	264	69	286	566	511	505	396	253	533	596	419	666	611	688	748	722	315	345	681	496	
Pittsburgh, Pa.	358	802	741	830	878	620	586	801	1023	—	(945)	362	540	440	699	708	186	218	536	646	—	(729)	765	669	774	609	830	(597)	376	656	(640)	
Washington, D. C. (WBCO)	—	894	945	788	—	—	—	370	666	830	868	439	362	—	712	—	192	411	612	764	742	688	805	820	836	829	778	666	735	781	689	

The foot-candle hour is the average illumination for one hour, in foot candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continu-

ous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in Illuminating Engineering, Vol. XLVI No. 2, pages 59 to 62.

### CORRECTION

Month: March 1953

Page 71: Severe Storm for Coffee, Anderson, Linn, Franklin and Miami Counties, Kansas: under Estimated Property Damage, "52,000" should read "302,000"; Remarks should read, "Damage from hail at Osawatomie previously reported as \$50,000 later estimated by insurance adjusters as \$300,000. Hail, \$300,000; electrical, \$2,000.

Month: May 1953

Pages 162: across bottom of pages, accumulated departures should read, Accumulated Departures January 1, 1953 to June 3, 1953.  
# 163



Table 3

State

February

Alaska  
Arkansas  
Aspette  
Barrow  
Bethel  
Cardova  
Fairbanks  
Galena  
Gambell  
Igneau  
Kaktovik  
McGrath  
Nome  
Northway  
St. Paul  
Tatort

### DELAYED DATA

February

Alaska  
Anchorage  
Annette  
Barrow  
Bethel  
Cardova  
Fairbanks  
Galena  
Gambell  
Igloo  
Kaktovik  
McGrath  
Nome  
Northway  
St. Paul  
Tatort

February

Alaska  
Anchorage  
Annette  
Barrow  
Bethel  
Cardova  
Fairbanks  
Galena  
Gambell  
Igloo  
Kaktovik  
McGrath  
Nome  
Northway  
St. Paul  
Tatort

1

This image shows a blank, aged, cream-colored page, likely an endpaper or flyleaf of a book. The paper has a slightly textured appearance with some minor discoloration and a vertical crease down the center. A horizontal fold is visible near the top edge. The page is otherwise empty of any text or markings.

- 220 -

# DEGREE DAYS

(Base 65°F.)

DELATED DATA

Table 3

State and station	Current season		Normals July through this month	State and station	Current season		Normals July through this month	State and station	Current season		Normals July through this month	State and station	Current season		Normals July through this month
	This month	Period July through this month			This month	Period July through this month			This month	Period July through this month			This month	Period July through this month	
<u>February 1953</u>				<u>March 1953</u>				<u>April 1953</u>				<u>May 1953</u>			
ALASKA				WASHINGTON				WASHINGTON				WASHINGTON			
Anchorage	1243	7429		Stampede Pass (CO)	1081	7238		Stampede Pass (CO)	920	8075		Stampede Pass (CO)	767		8711
Annette Island	738	4599		ALASKA				ALASKA							
Barrow	2410	13196		Anchorage	1332	8761		Anchorage	805	9566					
Bethel	1613	9004		Annette Island	812	5411		Annette Island	621	6032					
Cordova	926	6146		Barrow	2523	15719		Barrow	1877	17596					
Fairbanks	1743	10281		Bethel	1952	10956		Bethel	1088	12044					
Galena	1925	10625		Cordova	1142	7288		Cordova	801	8069					
Gambell	1915	9616		Fairbanks	1779	12060		Fairbanks	828	12888					
Juneau	851	5763		Galena	2016	12641		Galena	1090	13731					
Kotzebue	1994	10306		Gambell	1989	11605		Gambell	1418	13023					
McGrath	1788	10325		Juneau	1038	6801		Juneau	714	7515					
Nome	1698	9159		Kotzebue	2128	12434		Kotzebue	1411	13845					
Northway	1934	11544		McGrath	1853	12178		McGrath	964	13142					
St. Paul	1292	7281		Nome	1939	11098		Nome	1187	12285					
Yakutat	889	5795		Northway	1865	13409		Northway	998	14407					
				St. Paul	1420	8701		St. Paul	1068	9769					
				Yakutat	1059	6854		Yakutat	763	7617					

## SEVERE STORMS

Table 4

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
<u>May 1953</u>										
Lake Superior, Mich.	12	7:30 a.m.			17				Wind	Winds, up to 72 m.p.h. during previous night, sank S.S. Steinbreuner, a 400-foot ore carrier, 14 miles from Isle Royale.
Millerstown, Pa.	27	4:30 a.m.					\$8,000		Electrical	Lightning fired barn 5 miles east of here, destroying its contents, including 15 head of livestock.
Cottageville, Colleton County, S.C.	31	6:30-7 p.m.	65-130	8-10	0	0	3,500		Tornado	Vortex not seen, but damage indicated weak tornado.

See footnotes with current data



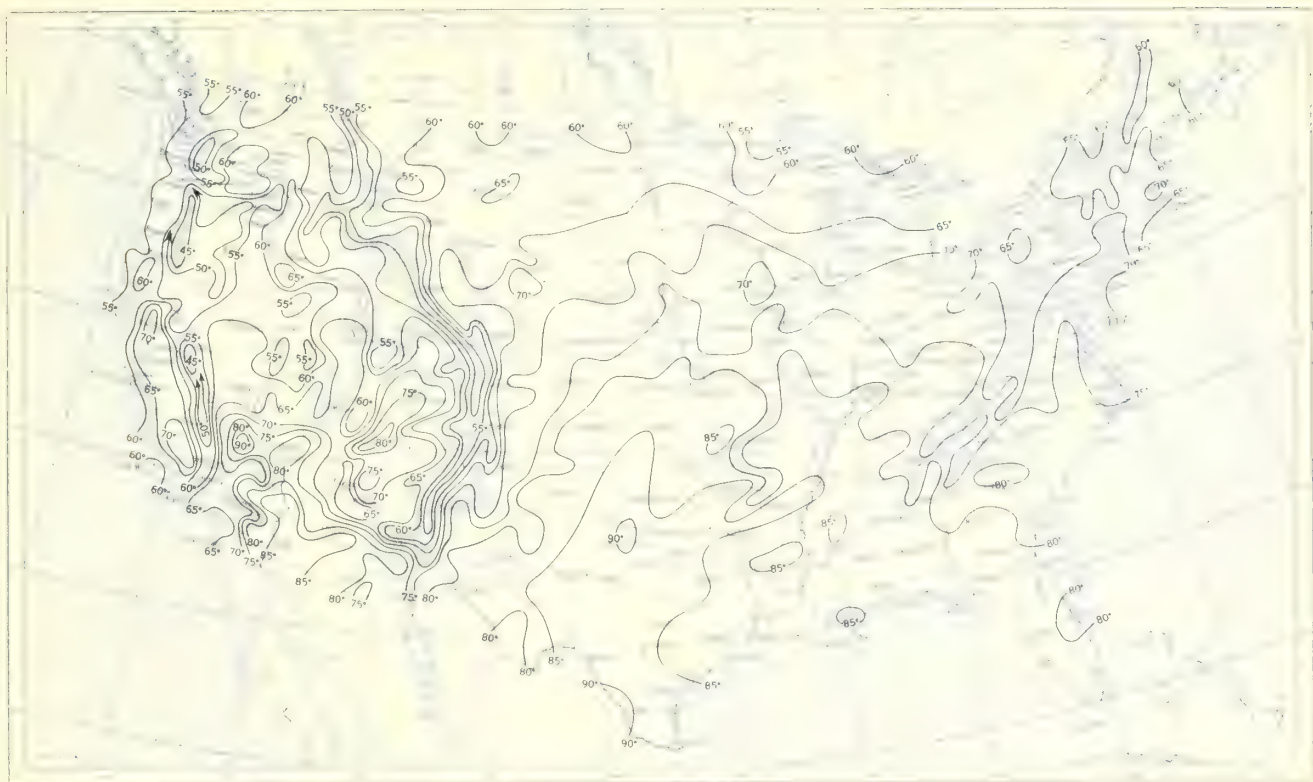
## DELAYED DATA

DELAYED DATA

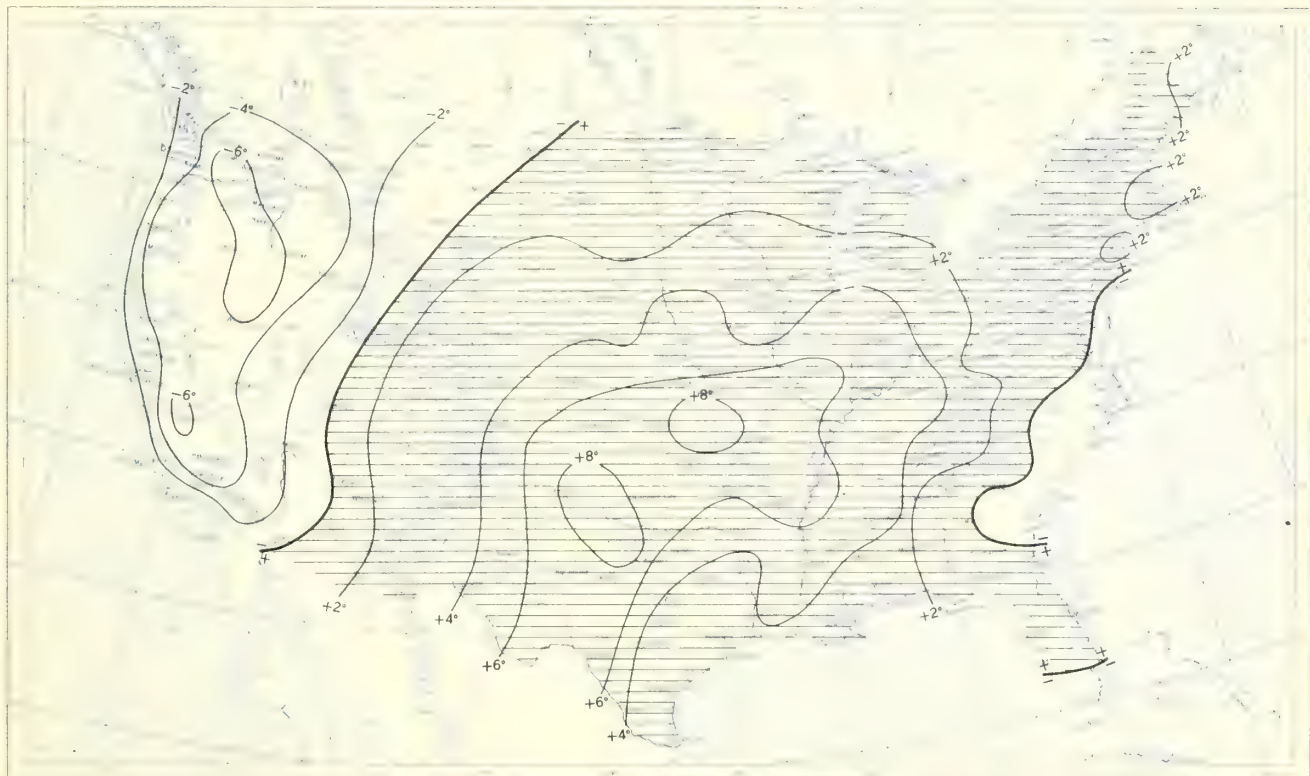
Accumulated Departures January 1, 1953 to June 3, 1953

NWRC, Asheville, N.C. --- 10/14/53 --- 2000

Chart I. A. Average Temperature ( $^{\circ}\text{F.}$ ) at Surface, June 1953.



B. Departure of Average Temperature from Normal ( $^{\circ}\text{F.}$ ), June 1953.

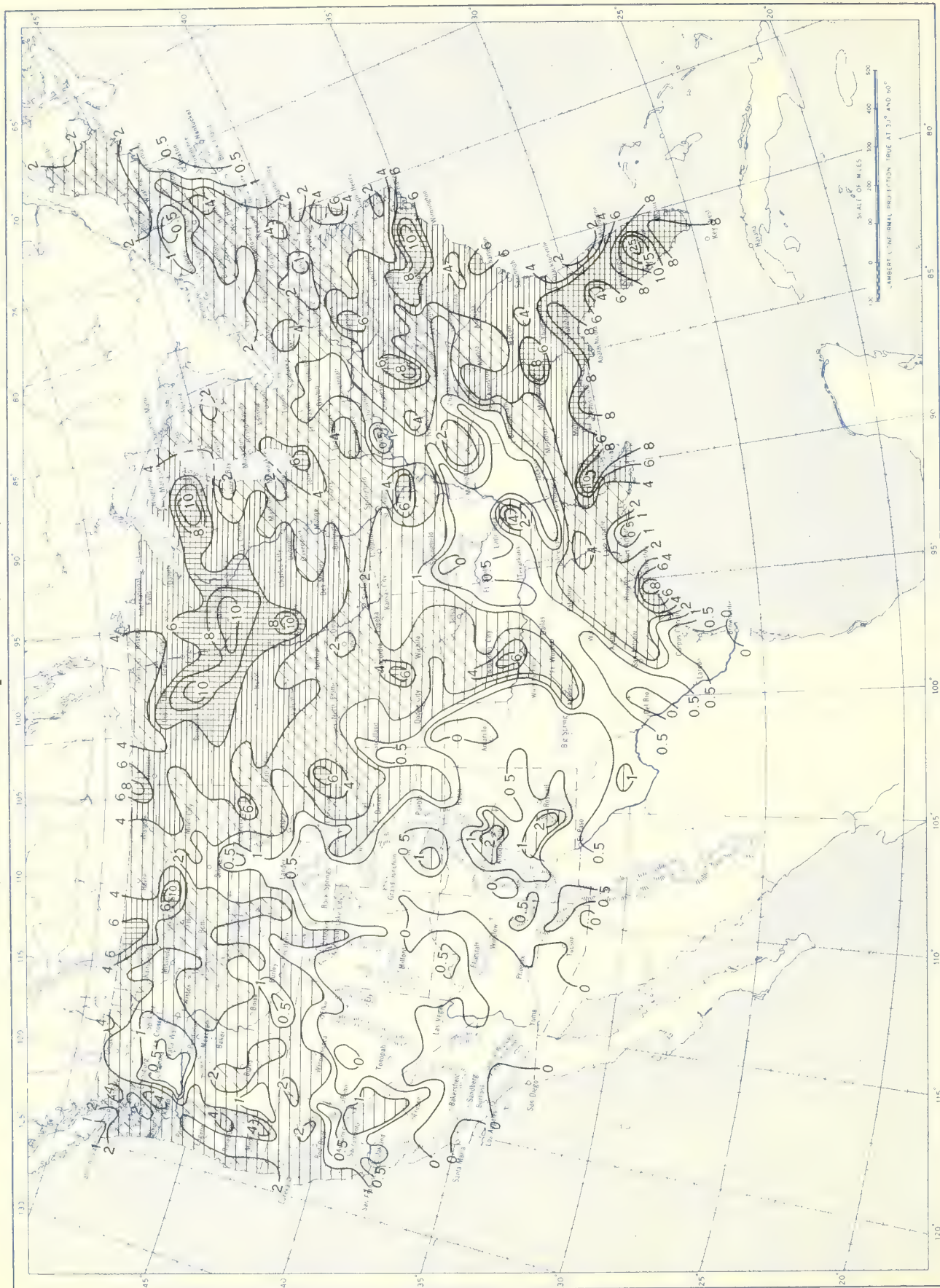


A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

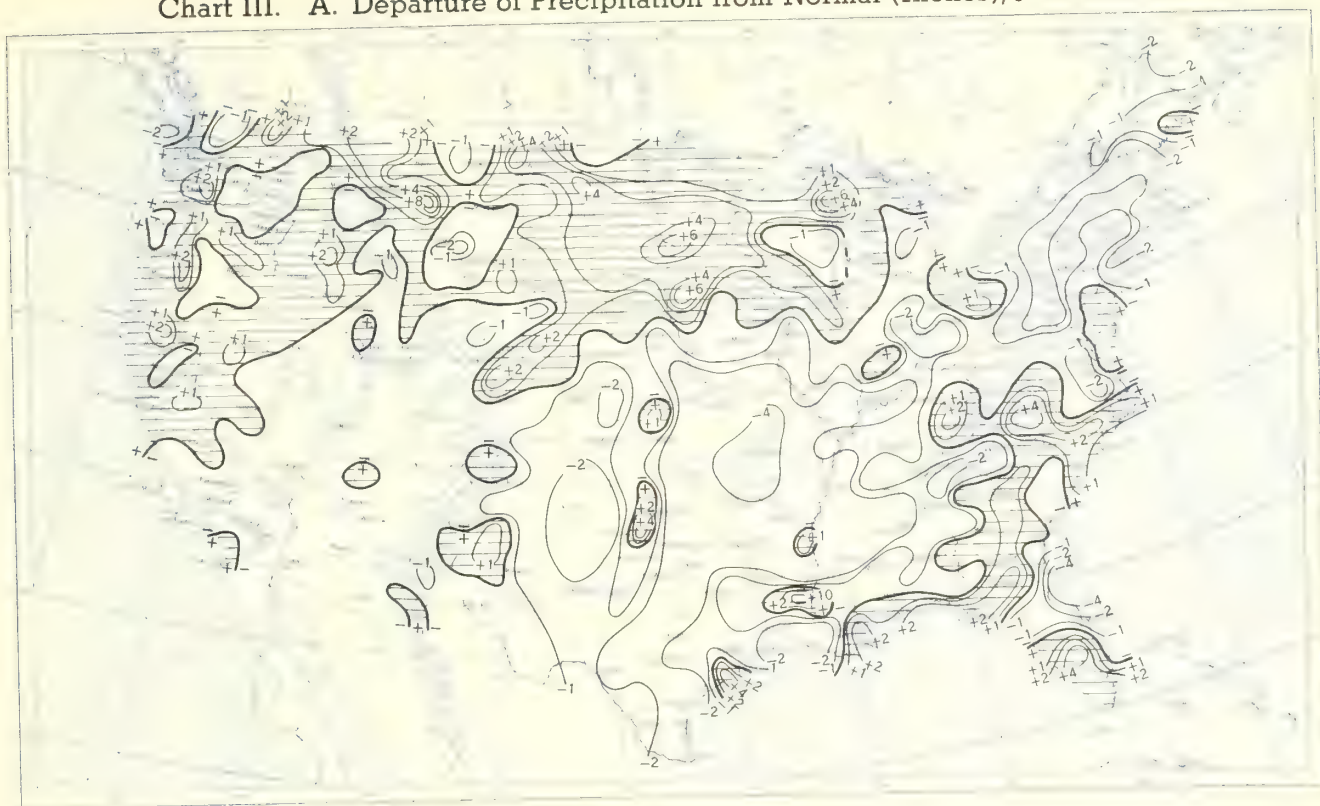


Chart II. Total Precipitation (Inches), June 1953.

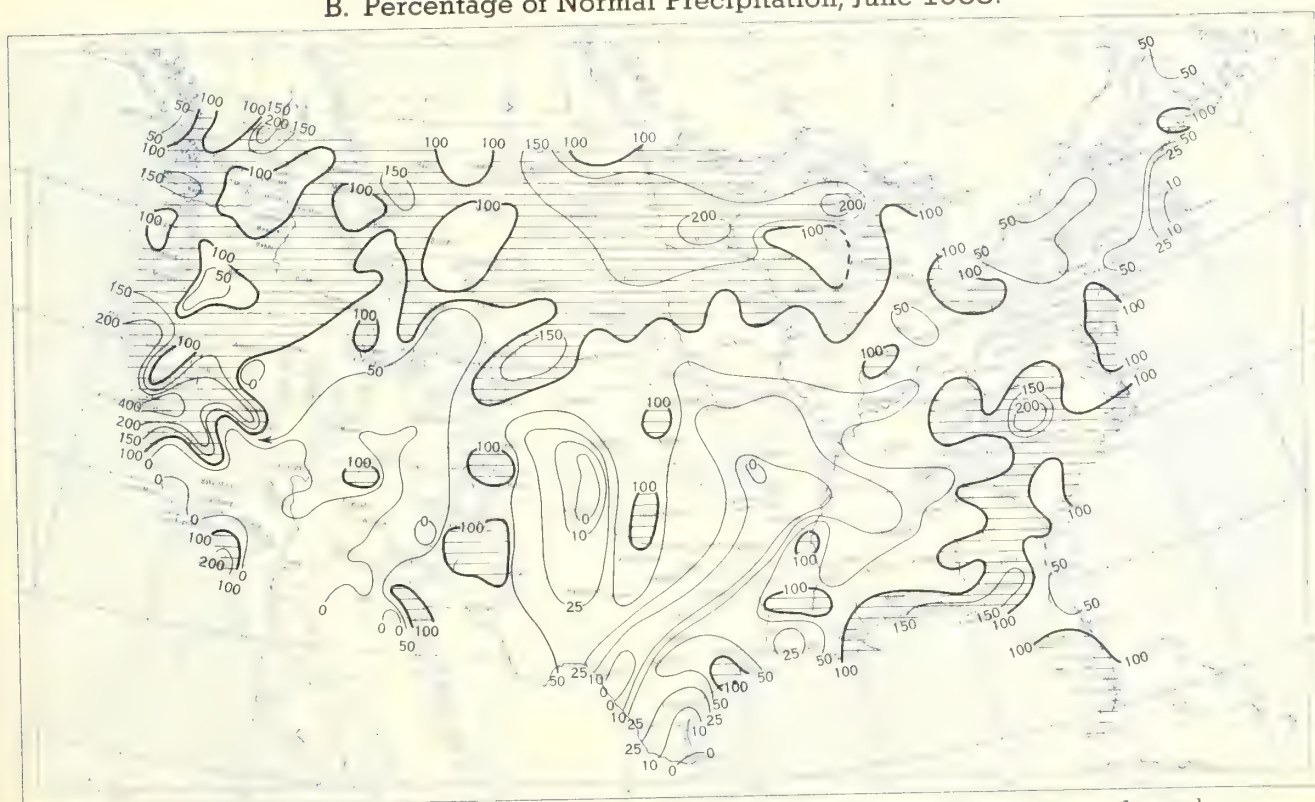


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), June 1953.



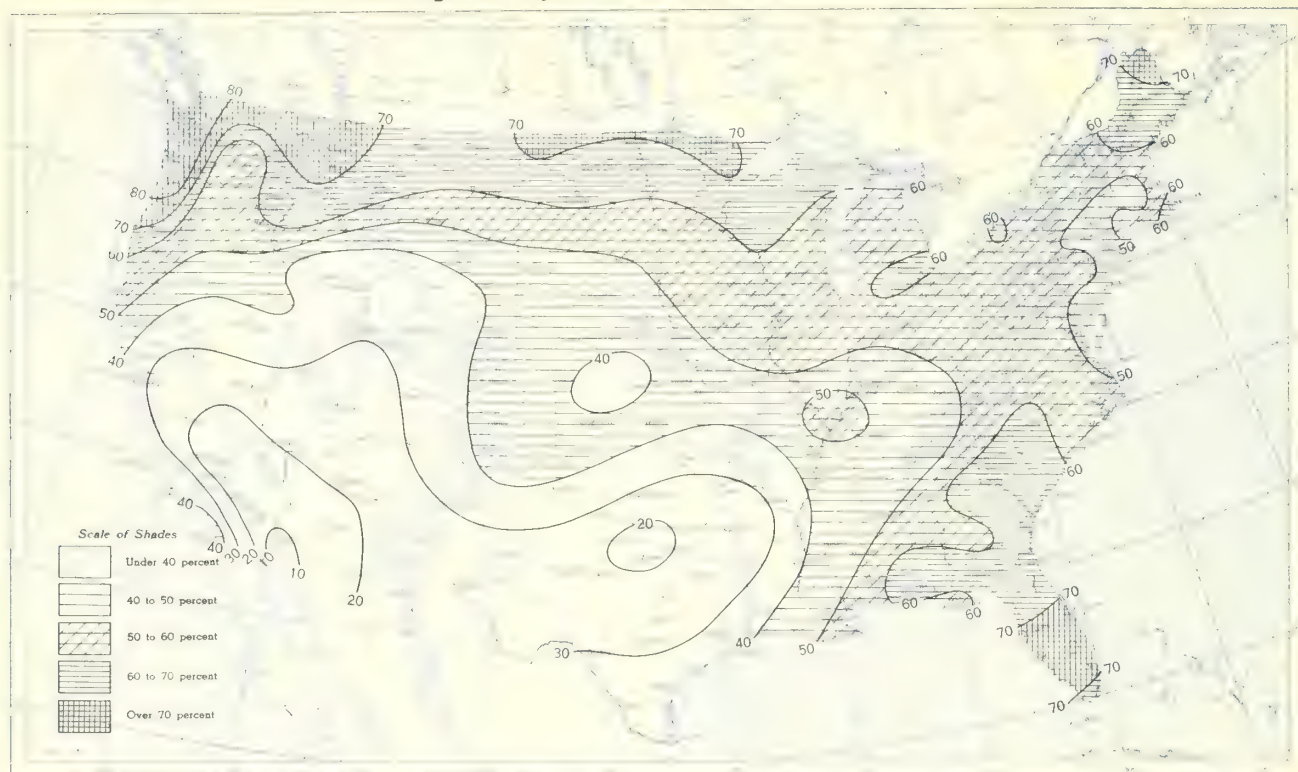
B. Percentage of Normal Precipitation, June 1953.



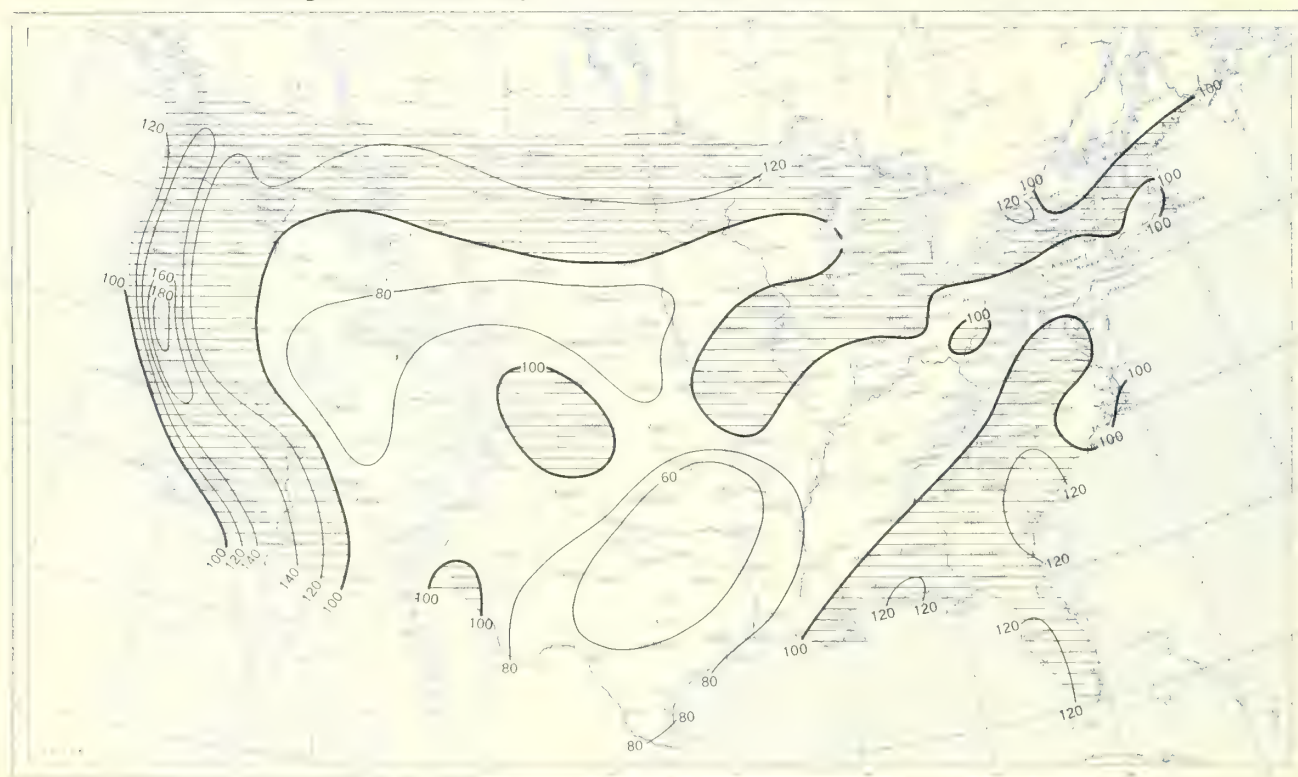
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.



Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, June 1953.

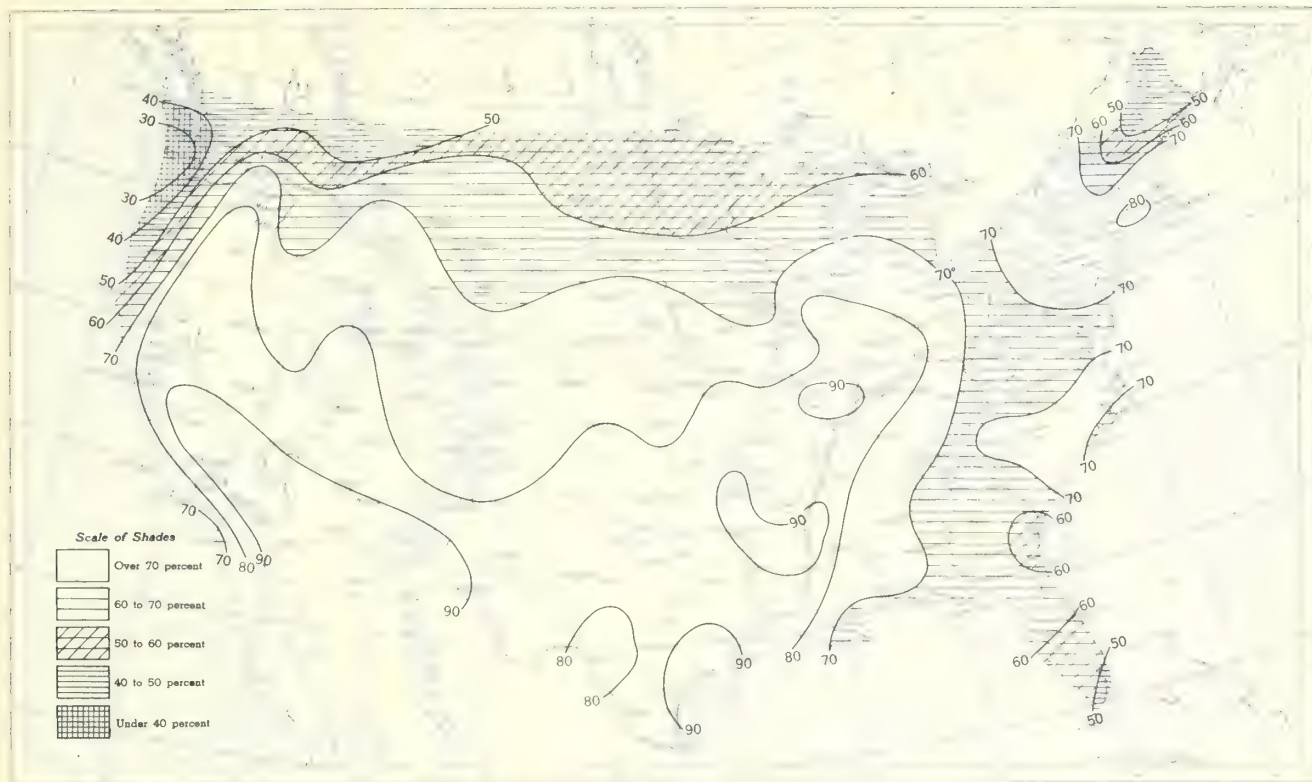


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, June 1953.

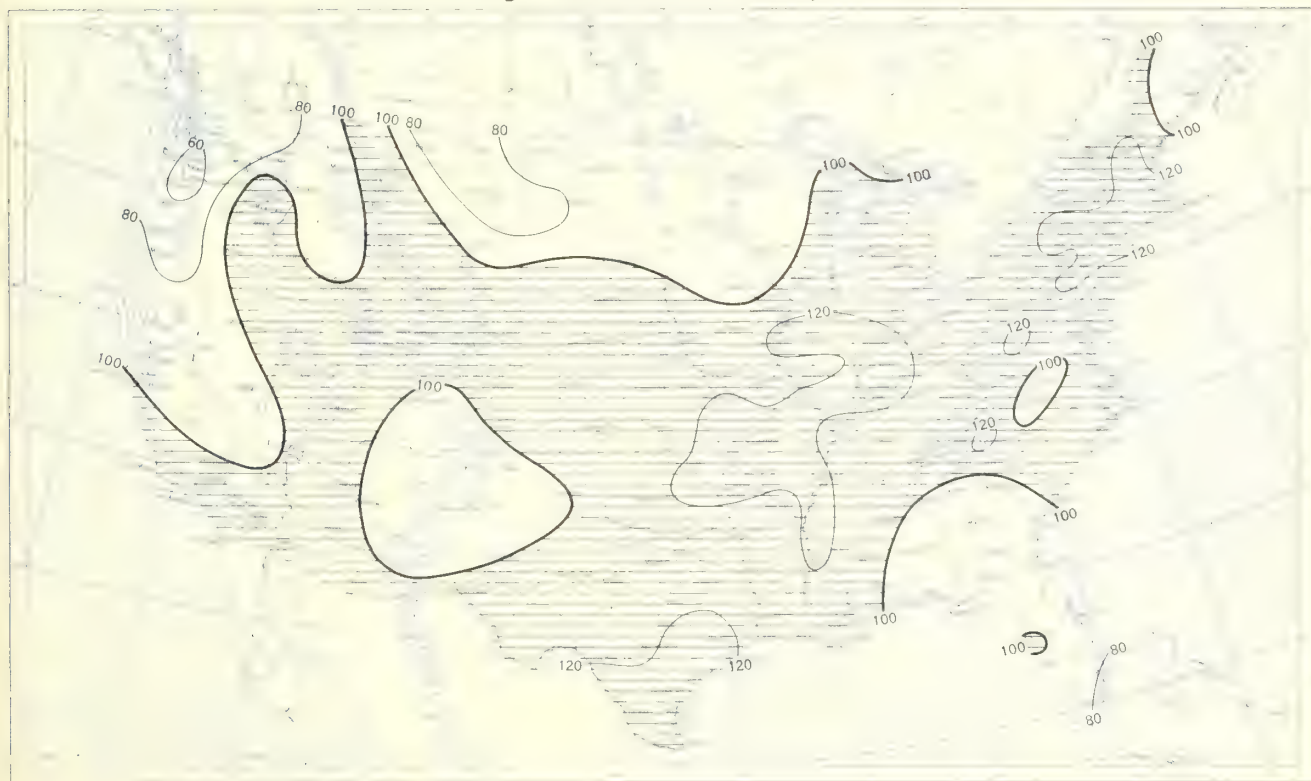


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, June 1953.



B. Percentage of Normal Sunshine, June 1953.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.



Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, June 1953. Inset: Percentage of Normal Average Daily Solar Radiation, June 1953.

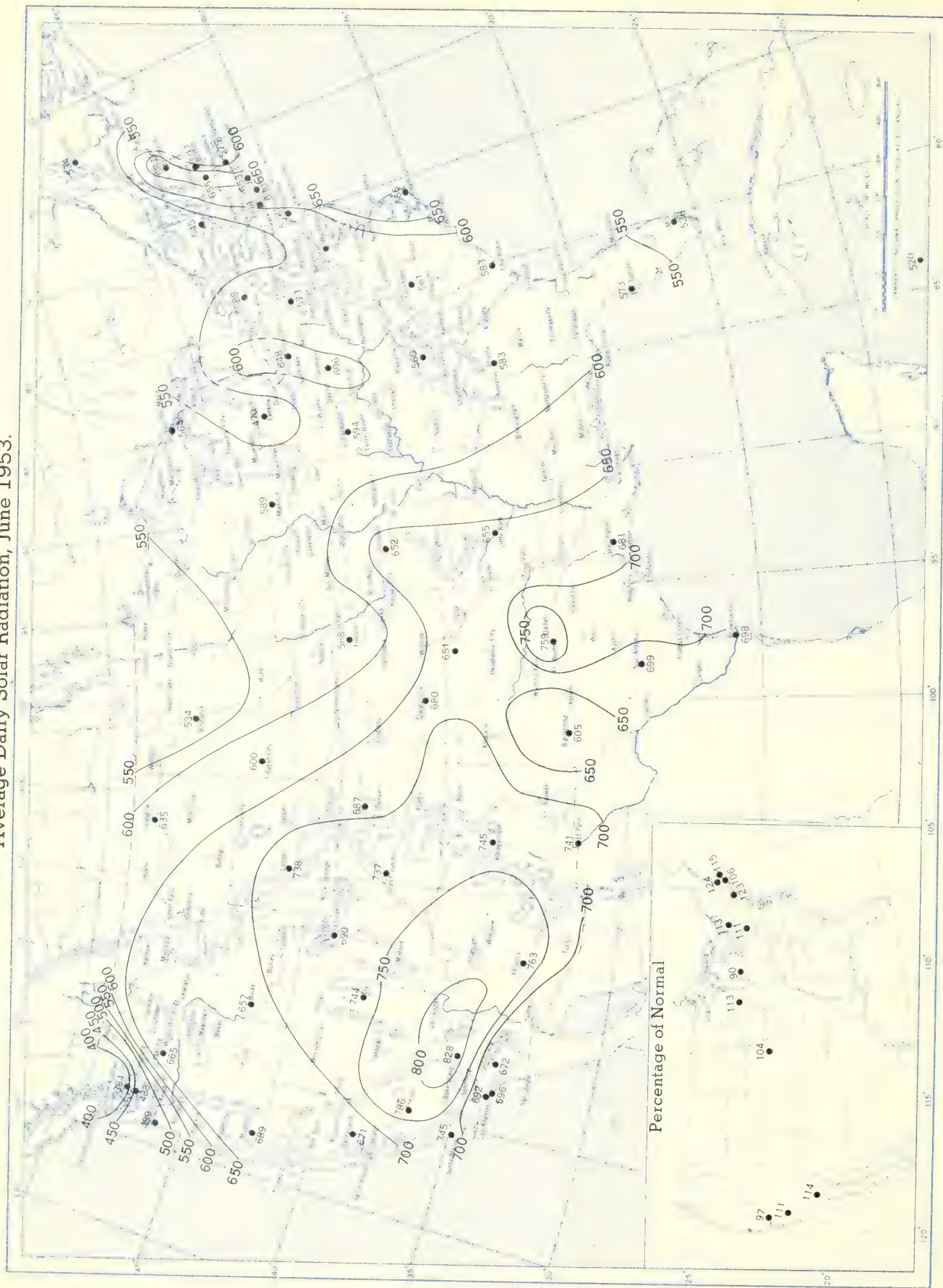


Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.⁻²). Basic data for isotherms are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals

Chart IX. Tracks of Centers of Anticyclones at Sea Level, June 1953.

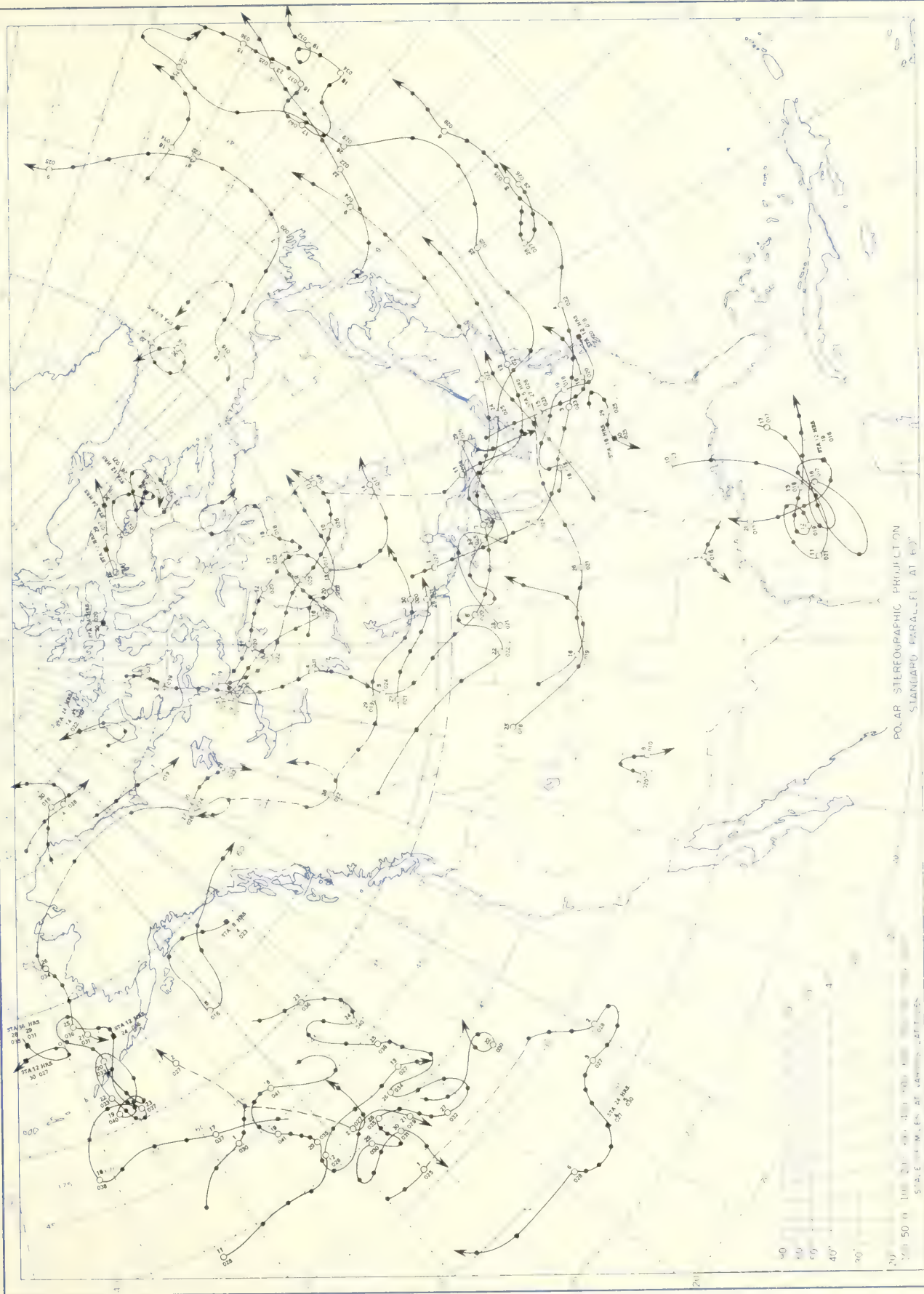




Chart X. Tracks of Centers of Cyclones at Sea Level, June 1953.

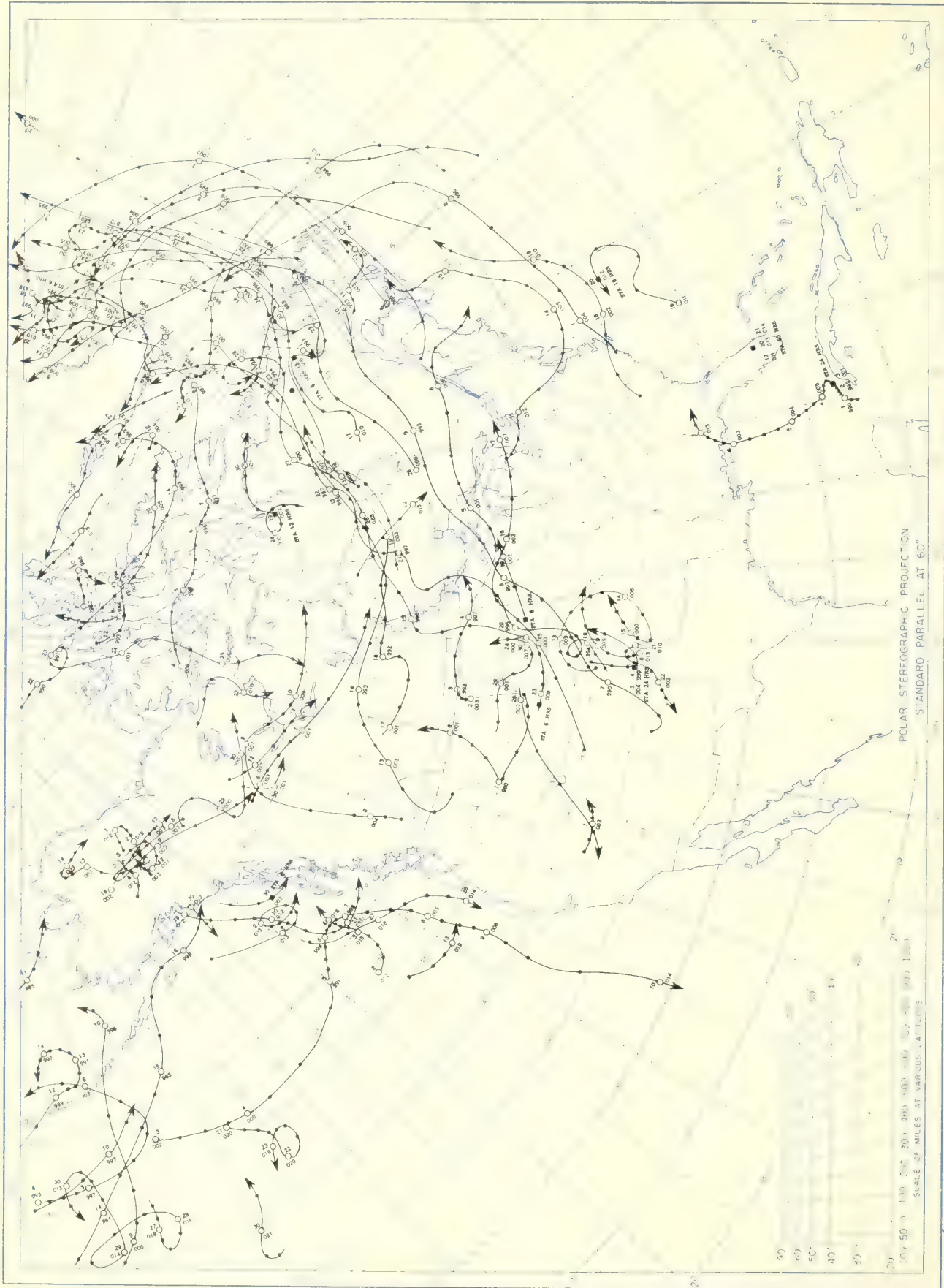
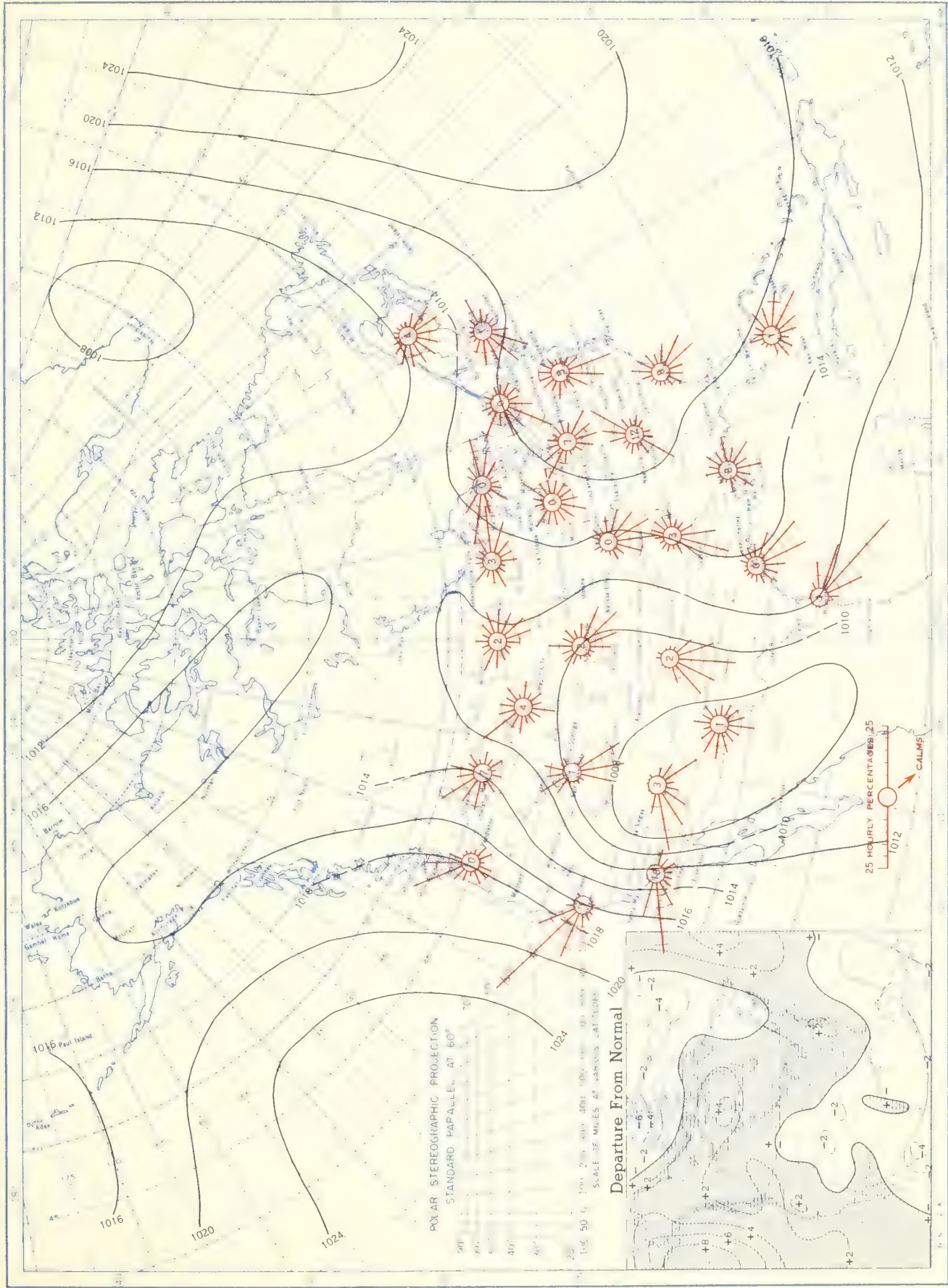


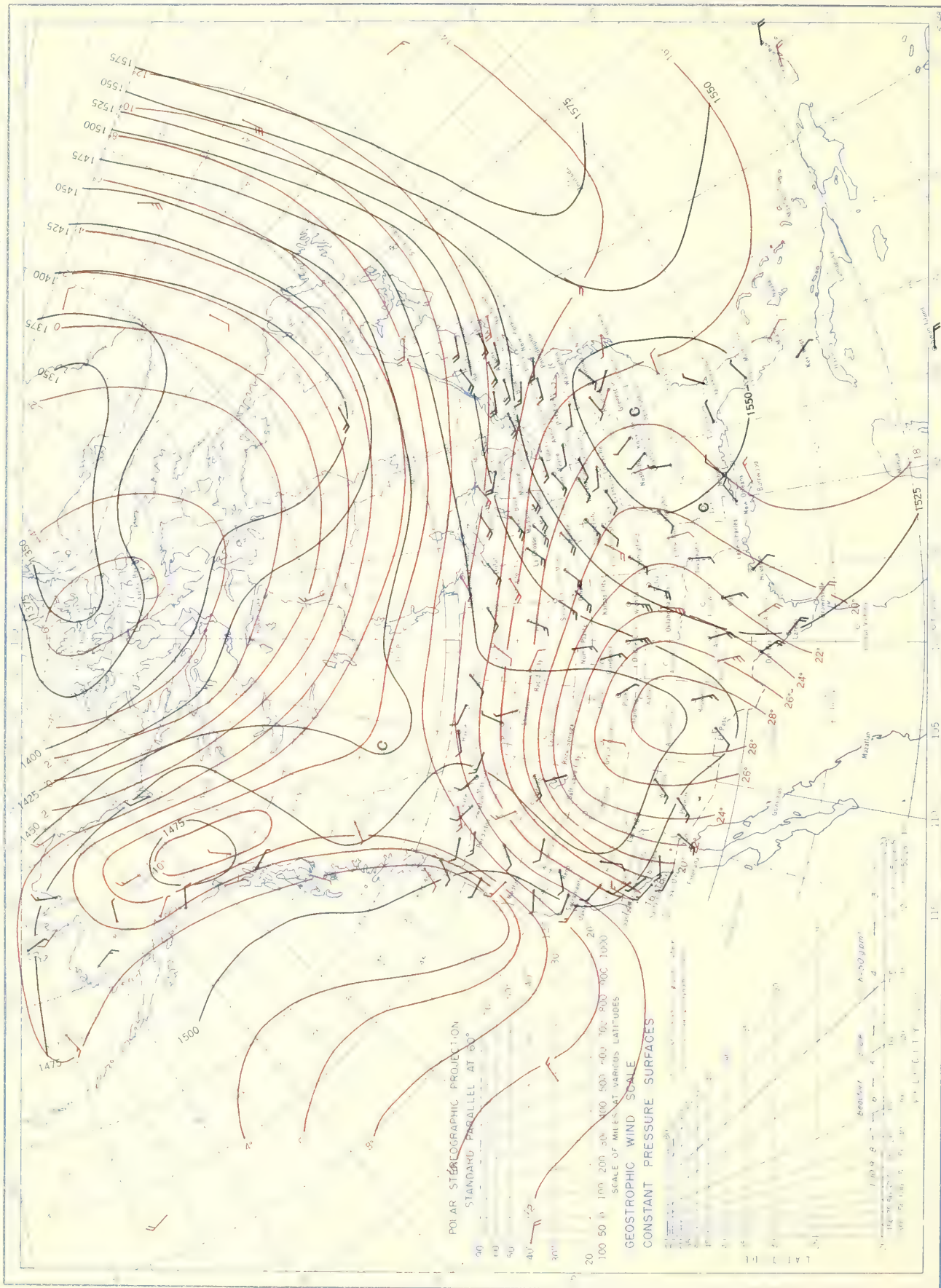
Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, June 1953. Inset: Departure of Average Pressure (mb.) from Normal, June 1953.



Average sea level pressures are obtained from the averages of the 7:30 a.m. and 7:30 p.m. E.S.T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° inter-sections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.



Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), June 1953.

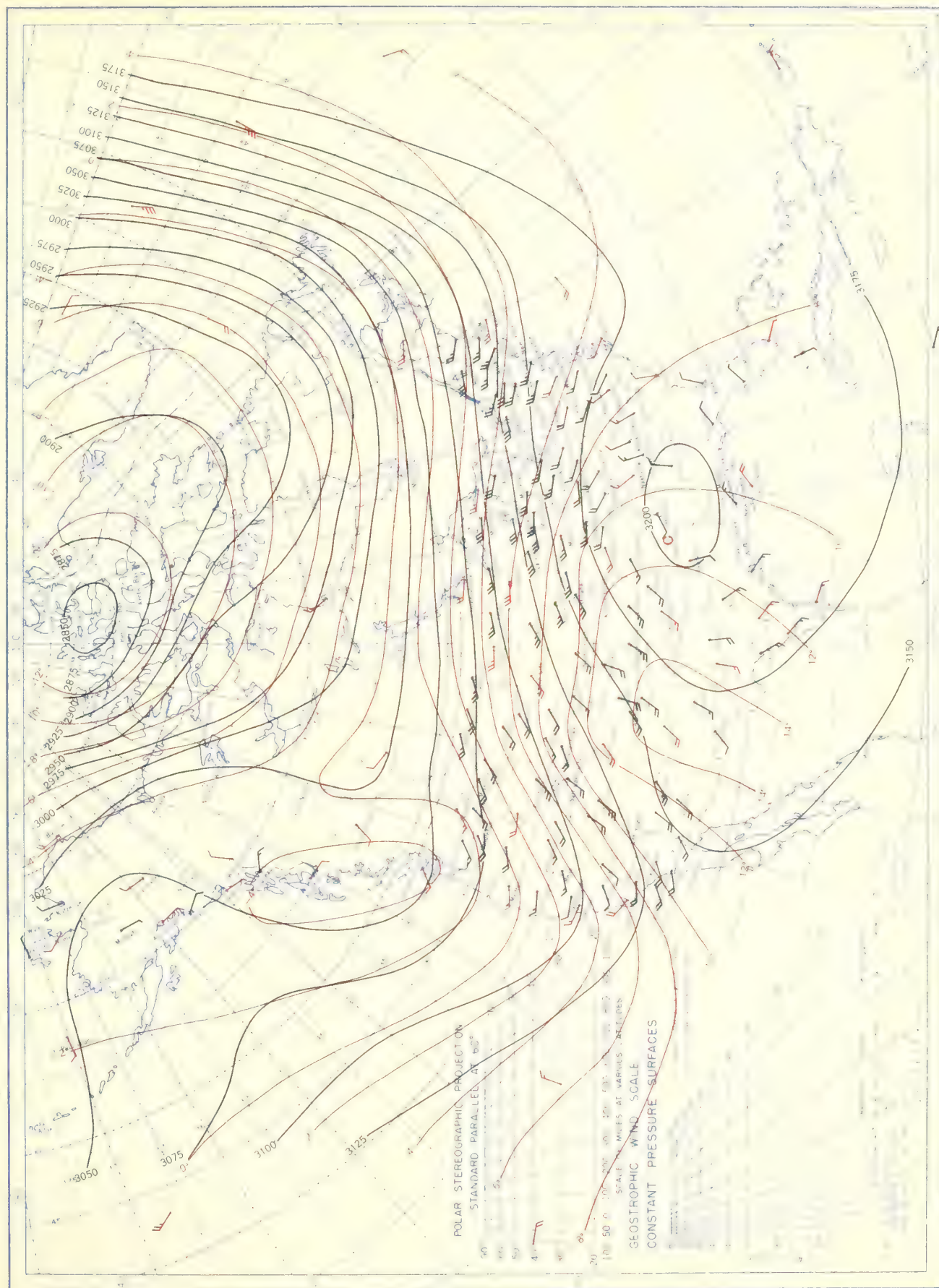


Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), June 1953.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), June 1953.

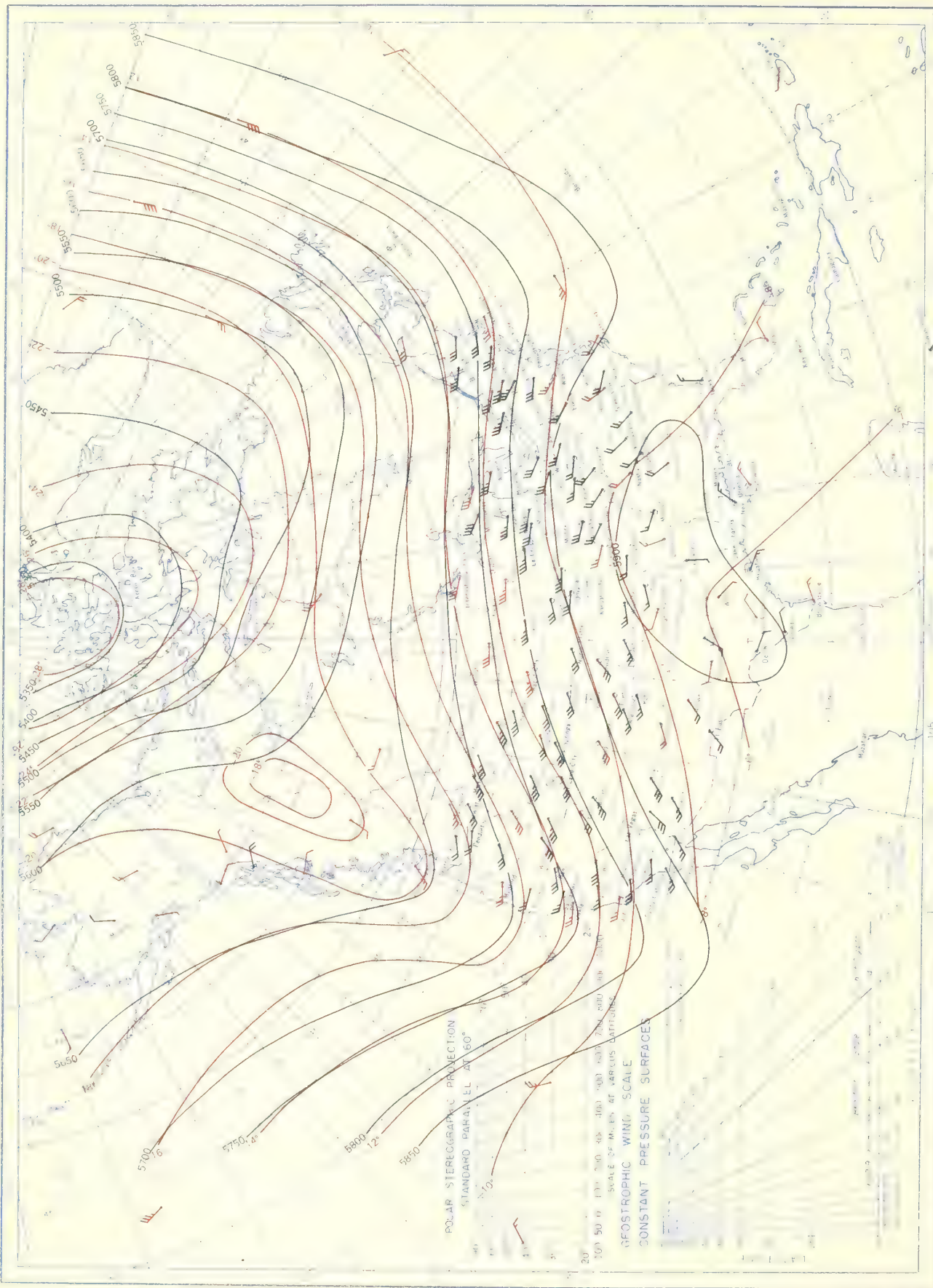
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

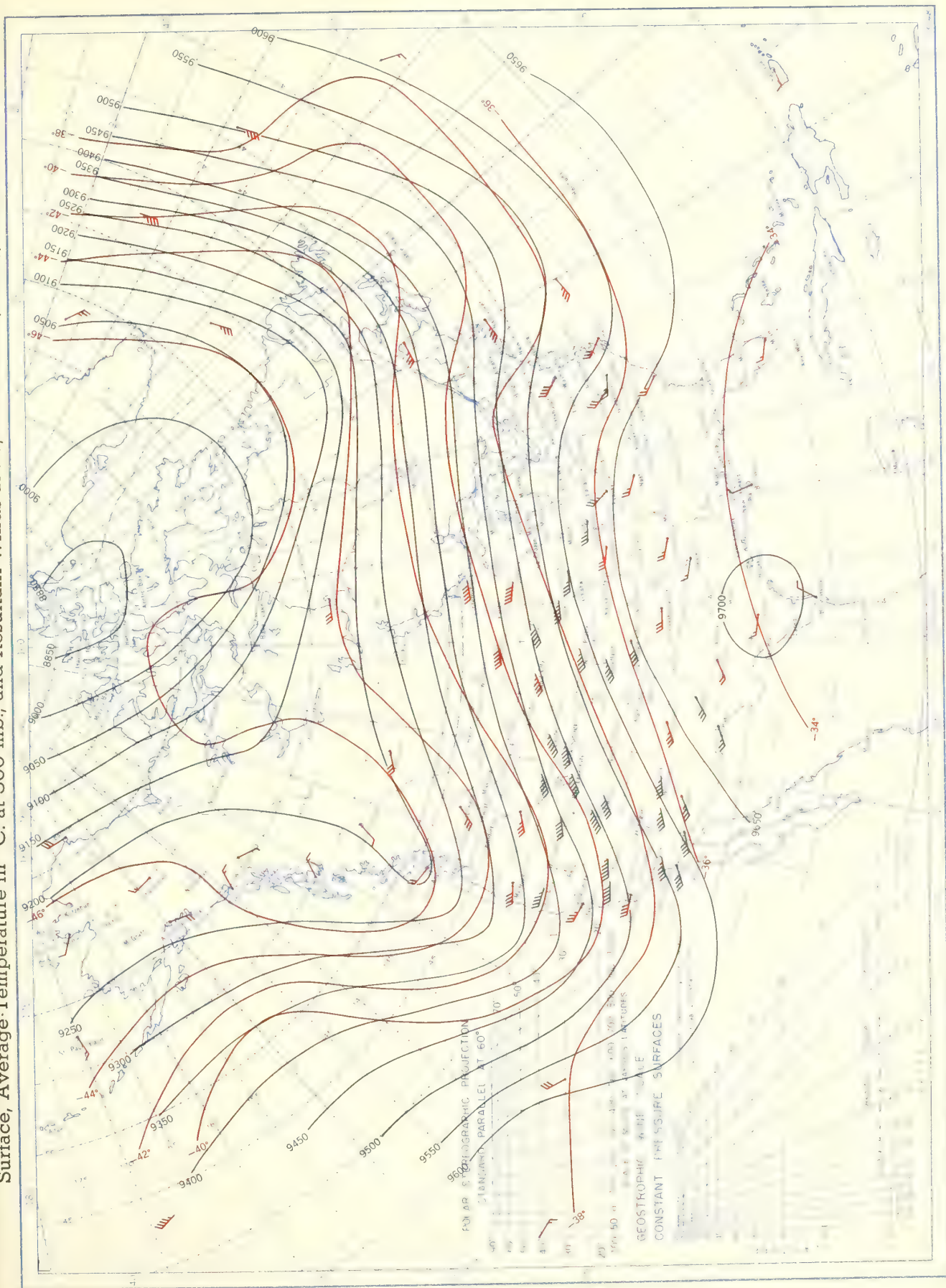


Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), June 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.90 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), June 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G.M.T. Winds shown in black are based on pilot balloon observations at 2100 G.M.T.; those shown in red are based on rawinsonde observations at 0300 G.M.T.



U.S. Department of Commerce  
WEATHER BUREAU  
Rm 201 Asheville, N.C.

OFFICIAL BUSINESS  
Permit No. 1024

Clemson College Library  
Clemson  
South Carolina

CD

Penalty for private  
use to avoid pay-  
ment of postage  
\$300.

U. S. DEPARTMENT OF COMMERCE

SINCLAIR WEEKS, Secretary

WEATHER BUREAU

F W REICHELDERFER Chief

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

JULY 1953

Volume 4 No. 7



ASHEVILLE: 1953



## C O N T E N T S

SURFACE DATA	Page
General Summary of Weather Conditions-----	223
Condensed Climatological Data - States-----	225
Climatological Data - Stations-----	226
Heating Degree Days-----	231
Severe Storms-----	232
General Summary of River and Flood Conditions-----	250
Flood Stage Data-----	251
UPPER AIR DATA	
Radiosonde Data-----	252
Pilot Balloon Data-----	255
Rawin Data-----	256
SOLAR RADIATION DATA	
Solar Radiation Intensities-----	257
Blue Hill Data-----	258
Daily Totals and Average Daily Totals by Weeks-----	259
Daily Illumination on a Horizontal Surface-----	261
CHARTS I-XV	

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

SUBSCRIPTION PRICE: Monthly and annual, 15 cents per copy; yearly subscription, including monthly and annual issues, \$1.50. Checks and money orders should be made payable to the "Treasurer of the United States." Remittance and correspondence regarding subscriptions should be sent to "Superintendent of Documents, Government Printing Office, Washington 25, D.C."

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

Volume 4 No. 7

JULY 1953

### GENERAL SUMMARY OF WEATHER CONDITIONS

General light to heavy rainfall that helped to relieve the drought in the south-central, southwestern, and northeastern sections of the Country was the main weather feature of the weather of July. Nevertheless the nationwide average rainfall continued below normal, and droughty conditions were intensified in Missouri and the Virginia-Carolina area. In Alabama, Georgia, Florida, and the north-central interior rainfall was sufficient to maintain good crop development. In spite of extremely dry weather in California and the Pacific Northwest, no serious moisture shortage developed there, thanks to the previous month's rains, and much sunny weather, particularly during the second half of the month, enabled crops to make good recovery from the retarding effects of the cold, wet weather of June. More than the usual number of thunderstorms occurred in the far Southwest, the upper Mississippi Valley, and in the Great Plains States from the Dakotas and eastern Montana southward through eastern New Mexico and northern Texas; elsewhere thunderstorm frequency was about normal or below. Sunshine was near to well above normal over virtually the entire Country. Harrisburg, Pa., recorded 85 percent of the possible sunshine, an amount equal to the July record in 1944, and Sacramento, Calif., recorded 100 percent for the third July in 50 years. Severe storms were much less frequent than during June. Wind movement was above normal in the Southwest but the departure from normal there this month was less pronounced than it was for the previous 3 months.

**PRECIPITATION.**—July rains improved the overall crop outlook in south-central, southwestern, and northeastern sections of the Country but severe drought continued in the Rio Grande Valley and much of western Texas where rainfall was light (generally less than 0.50 inch), and in many other southern areas the rains were too late to help early corn. Moderate to heavy rains, with monthly totals exceeding 10 inches at many stations, were quite general in Mississippi, Louisiana, Arkansas, Oklahoma, and Arizona, breaking the drought, at least temporarily, in nearly all parts of these States.

In Oklahoma the statewide average rainfall was 5.72 inches (second highest on record for July) and no station reported less than 1.23 inches; at the end of the month surface soil moisture and stock water supplies were adequate and late crops and pastures were making good growth. In Arizona and New Mexico frequent showers that were general and moderate to heavy about the middle of the month appreciably improved ranges and surface water supplies. In the former State, July rainfall averaged over an inch above normal and a number of stations in the northeastern Plateau, the central mountain region, and the southeast reported the heaviest July amounts in many years.

Relief from the dry weather came to central and southern New England on the 13th and 14th

when a coastal storm brought the first substantial rainfall since May to that area. In other northeastern sections relief came on the 22d and 23d when moderate to heavy rains fell during the passage of a cold front. These rains were of unusual intensity in southwestern Connecticut where more than 7 inches fell in 6 to 8 hours in the vicinity of Bridgeport.

In Virginia and the Carolinas large sections east of the mountains received less than an inch of rain for the month. This was the driest July since 1930 in Virginia and one of the 3 driest during the last 60 years in North Carolina. Raleigh, N. C., received the least amount (0.38 inch) for July in 87 years of record. Pastures and late-planted crops in these States were particularly hard hit, and much of the corn crop in Virginia was damaged beyond recovery.

In Missouri July precipitation was less than 10 percent of normal in some southeastern sections and less than 50 percent in most of the southern two-thirds of the State. Two stations, Van Buren and Fremont Tower, reported no precipitation at all. For the State as a whole this was the driest July since 1940 and the seventh driest on record. Hay and pastures in the south deteriorated steadily and corn and soybeans needed rain badly at the end of the month. In adjacent areas of west-central and southern Illinois pastures also deteriorated. In western portions of Kentucky and Tennessee corn and soybeans were greatly benefited by rains on the 23d.

In Florida, Georgia, and Alabama, frequent well distributed rains totaled more than 10 inches for the month at many stations including Butler, Ga., which recorded 16.39 inches for the highest in the United States. These rains maintained ample soil moisture throughout the month and crop growth was good.

In the northern Great Plains precipitation was below normal and the topsoil was becoming quite dry in many sections at the end of the month, but subsoil moisture was ample as a result of generous rains in May and June and crops developed well. In the upper Mississippi Valley and upper Great Lakes rainfall was above normal for the month and unusually heavy in a few sections. Flooding in the upper Minnesota River Basin during the first decade caused considerable crop damage. Floods in northeastern Iowa, resulting from rains of 5 to 7 inches over extensive areas, still covered much farm land at the end of the month.

**TEMPERATURE.**—For the Country as a whole July was slightly warmer than normal, with the greatest departures occurring in southern Texas and the Rocky Mountain region and southern California. A few stations reported the highest July averages on record including Corpus Christi and Del Rio, Tex., with 87.1° and 89.7° respectively; and Lander, Wyo., with 73.5°. The maximum temperature at Del Rio equaled or exceeded 100° on all but 4 days. Monthly extremes also set new July records at a few stations including Tucson,



# GENERAL SUMMARY OF WEATHER CONDITIONS—Continued

JULY 1953

Ariz., 110° on the 1st, and Dallas, Tex., 106° on the 9th. The highest temperature (123°) for the month was recorded in Death Valley, Calif., at Cow Creek on the 23d and Greenland Ranch on the 22d and 23d. Highest temperatures in the southern Mountain States generally occurred during the first few days of the month and in the northern Mountain States during a hot spell about the middle of the month. East of the Rocky Mountains the hottest weather in most of the South occurred during the first week, in the extreme north-central interior and Northeast about the middle of the month, and in the remaining or middle sections during hot spells at the beginning, middle, or end of the month.

The outstanding cool spell of the month occurred in the northeastern quarter of the Country following the general rains on the 20th-23d. On the 24th Vanderbilt and Cornell, Mich., recorded minima of 32° and 35° respectively, with light frost reported by the latter station on the 25th. Light frost occurred also in scattered sections of the Adirondack Mountains. Freezing was reported by 16 stations in western Montana during the last decade. Austin, Ore., recorded the lowest temperature of the month, 22°, on the 18th. During another cold spell in the northeastern quarter on the 3d and 4th, minima in the 40's were reported in the upper Lakes, and 40.7° at Duluth, Minn., was the lowest July temperature recorded there in 80 years of record.

**DESTRUCTIVE STORMS.**—Hailstorms produced the most destructive weather during July. They caused well over one-half of the total storm damage for the month, being particularly destructive in Nebraska, Iowa, Montana, and Minnesota. The most outstanding single storm (also one of the most destructive on record) caused \$6,000,000 damage to unharvested wheat in the extreme southwestern part of the Nebraska Panhandle on the 2d. Many of these storms occurred in Iowa on the 5th, with crop damage particularly severe in two areas—one including parts of Lyon, Osceola, and Dickinson Counties where total damage was estimated at \$2,500,000, and the other including parts of Clay, Palo Alto, and Kossuth Counties where estimated damage totaled \$1,750,000. Hail damage in Montana during the last 11 days of the month exceeded \$1,000,000, and the month's hail losses in Minnesota were estimated at \$975,000.

Other types of particularly severe storms included a \$1,000,000 thunderstorm in Montgomery, Ala., on the 2d, a \$2,000,000 wind- and rain-storm in Denver, Colo., on the 9th, and \$500,000 at Waterloo, Iowa, by wind (gusts up to 100 m.p.h.) and rain on the 5th.

Total damage for the month was somewhat in excess of \$20,000,000, approximately 28 people lost their lives, and 62 were injured. Tornado damage was below normal, totaling about \$236,000, in contrast with the nearly \$78,000,000 that occurred in June.

# CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

JULY 1953

Section	Temperature								Precipitation							
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes				Least	
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least		
	°F.	°F.		°F.				°F.		in.	in.		in.		in.	
Alabama	80.0	-0.3	2 Stations	101	°2	Cordova	53	11	6.00	+0.51	Hytop	11.22	Danville		1.37	
Arizona	80.7	+5.5	Gila Bend	119	2	Fort Valley	39	1	2.88	+1.21	Mount Lemmon	10.88	2 Stations	T		
Arkansas	80.2	-0.3	Batesville Livestock	109	7	Gilbert	49	11	4.65	+0.91	Mena	14.84	Mammoth Spring		.49	
California	77.0	+1.3	2 Stations	123	°22	Boca	27	1	.06	-0.04	Needles CAA AP	1.40	385 Stations		.00	
Colorado	69.5	+2.1	3 Stations	110	°1	Fraser	27	°2	2.31	+0.29	Springfield 8S	5.81	Haswell		.18	
Connecticut	71.4	+1.3	Waterbury	100	18	Norfolk 28W	41	25	4.33	+0.40	Willimantic	9.46	Salisbury		1.69	
Delaware	76.7	+0.6	Laurel 28W	102	18	Georgetown	49	11	3.64	-1.05	Wilmington Porter Res.	5.93	Georgetown		2.05	
Florida	81.8	+5.4	4 Stations	100	°3	Niceville	62	°13	7.57	+1.11	Sanford	14.71	Panama City		2.02	
Georgia	80.0	-0.3	do	102	°1	Blairsville Exp. Sta.	46	14	6.98	+1.13	Butler	16.39	Augusta WB AP		1.46	
Idaho	69.2	+0.8	Kooskia	111	12	2 Stations	27	°26	.12	-0.49	Strevell	1.69	42 Stations		.00	
Illinois	77.4	+1.0	Alton Dam 26	108	29	Freeport	47	10	3.67	+0.44	Watacka	11.75	Carmi		.36	
Indiana	75.8	+0.2	3 Stations	103	°30	2 Stations	45	°10	4.40	+1.07	Pendleton Reformatory	9.27	Mt. Vernon Wtr. Wks.		.84	
Iowa	74.6	-0.3	do	102	°5	Independence 2W	40	8	3.28	-0.32	Decorah	9.97	Fairfield		.38	
Kansas	78.8	-0.8	4 Stations	111	°1	3 Stations	51	°10	2.94	-0.01	Morton 8SSE	9.20	Bird City		.49	
Kentucky	77.2	+0.2	Murray	102	°6	4 Stations	47	11	3.74	-0.40	Covington WB AP	7.79	Greensburg Hwy 61		1.48	
Louisiana	81.4	-0.7	Bastrop	103	7	2 Stations	58	11	5.89	+0.20	Amite	15.72	Hessmer		1.79	
Maine	67.4	+0.2	Brunswick	98	17	Prentiss	34	29	3.56	+0.20	Bangor Dow Field	5.97	Winslow		1.96	
Maryland	76.8	+1.6	Keedysville	105	17	Oakland	36	11	3.34	.94	Clear Springs	10.76	Ocean City		1.19	
Massachusetts	70.2	-0.4	3 Stations	99	°18	West Cummington	37	25	3.38	-0.12	Edgartown	5.98	Ware 2		1.21	
Michigan	69.5	+0.5	Allegan	104	1	Vanderbilt	32	24	3.40	+0.66	White Pine Mine	8.56	Charlotte		.85	
Minnesota	68.9	-0.9	Winnebago	97	20	2 Stations	38	3	4.33	+1.01	Elgin	10.01	Long Prairie		.65	
Mississippi	80.9	-0.2	Clarksdale	104	6	Forest	53	11	5.65	+0.60	Shuqualak	13.00	Stoneville Exp. Sta.		1.83	
Missouri	79.2	+1.5	Union 1SE	106	31	Hermitage	44	10	1.92	-1.61	Walden CAA AP	5.48	2 Stations		.00	
Montana	67.9	-0.5	2 Stations	109	12	Summit	27	28	.71	-0.68	Chinook 15N	3.91	3 Stations		.00	
Nebraska	76.1	+0.7	Curtis	111	1	Henzel 19S	43	6	2.71	-0.38	Koshopah 10ENE	7.38	Thurston		.51	
Nevada	75.0	+1.5	Overton	116	°4	Jarbridge	31	21	.41	+0.02	Pioche	2.79	13 Stations		.00	
New Hampshire	68.8	+0.7	West Lebanon	100	19	Fabyan	36	11	2.85	-0.84	First Conn Lake	6.05	New Castle		1.25	
New Jersey	74.7	+0.7	Flemington 1NE	103	18	Layton 3NW	40	25	3.91	-0.83	Trenton WB City	7.13	Cape May 3W		1.53	
New Mexico	75.0	+1.5	Jal	112	7	Eagle Nest	32	13	2.38	+0.12	Ruidoso	6.11	Jones Trading Post		.28	
New York	70.0	+0.7	Whitehall	103	18	Speculator	29	25	3.07	-0.81	Wiscoy	7.33	Watertown CAA AP		.79	
North Carolina	78.1	+0.7	Jackson	105	31	Transou	40	12	2.86	-3.09	Batteras WB City	10.67	New Bern CAA AP		.28	
North Dakota	68.1	-1.5	Medora 4NNE	97	18	3 Stations	38	°8	1.51	-0.96	Park River	3.64	Foxholm 7N		.43	
Ohio	74.4	+0.7	4 Stations	100	°1	APCO Ravenna Arsl.	36	25	3.54	-0.23	Galion Water Wks.	9.59	Summerfield 3NE		1.09	
Oklahoma	80.7	-1.6	Buffalo	110	°4	Buffalo	50	12	5.72	+2.93	Kiamichi Tower	17.36	Wyandotte		1.23	
Oregon	65.8	-1.1	Huntington	109	13	Austin 3S	22	°18	.05	-0.39	Seaside	.97	108 Stations		.00	
Pennsylvania	72.5	+0.3	Stroudsburg	104	19	Kane 1NNE	33	25	3.52	-0.80	Whitesburg	7.30	Dushore 2NE		1.14	
Rhode Island	70.0	-0.4	Providence WB AP	94	17	Kingston	46	°5	4.77	+1.84	Kingston	6.24	Greenville		4.15	
South Carolina	80.3	+0.4	Tilghman Forest Nrsy.	105	7	2 Stations	53	°11	3.74	-2.15	Sullivan's Island	8.84	Fort Mill 4NW		.81	
South Dakota	71.9	-1.2	Ardmore	105	°23	Deerfield Dam	37	17	2.18	-0.24	Raymond	8.61	Spearfish 1W		.30	
Tennessee	77.8	.0	2 Stations	102	°5	2 Stations	48	°11	5.13	+0.63	Elora	10.53	Springville		.80	
Texas	83.6	+1.2	3 Stations	109	°6	Mount Locke	52	29	2.20	-0.30	Albany	11.57	8 Stations		.00	
Utah	73.7	+1.8	Moab	111	8	Scofield Dam	30	3	1.21	+0.25	Cedar Breaks NM	4.76	Myton		.03	
Vermont	68.6	+0.7	Bellows Falls	102	19	Lewington	36	25	2.44	-1.38	Newport	6.22	Somerset		.88	
Virginia	77.1	+1.8	Farmville	105	30	2 Stations	41	°11	2.37	-2.25	Speedwell	7.19	Somerset		.39	
Washington	65.9	-0.8	Trinidad 2SSE	106	11	Newport	31	17	.35	-0.30	Rainier Carbon Rvr E	2.52	42 Stations		.00	
West Virginia	73.7	+0.6	4 Stations	101	°18	Canaan Valley	33	11	3.17	-1.41	Philippi	6.08	Grantsville		.55	
Wisconsin	69.5	-0.6	Racine	99	1	Land O Lakes	33	24	4.40	+0.98	Wausau Old P. O.	10.61	Sheboygan		.60	
Wyoming	69.2	+2.8	2 Stations	104	14	Bondurant	26	°2	.91	-0.35	Pine Bluffs	6.39	3 Stations		.00	

\* Other dates also.



## CLIMATOLOGICAL DATA

JULY 1953

Table 2

State and station	Elevation (ground)	Pressure			Temperature										Precipitation										Wind				No. of days					
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point	Average relative humidity		Total	Departure from normal	Greatest in 24 hours	Of inch or more	With thunderstorms	Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		to sunset						
												Max 90° F. or above	Min 32° F. or below		Total	In.						In.	In.			In.	In.	In.	M.	M.	Date	Clear	Partly cloudy	Cloudy
	ft.	Mb.	Mb.	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	In.	In.	In.																	
ALABAMA																																		
Anniston	599	-----	1017.6	90	68	78.8	-0.9	97	1	57	12	17	0	70	--	3.51	-1.32	0.72	13	13	0.0	0	4.3	NE	*22	S	31	7	11	13	6.1	--		
Birmingham	610	993.6	1018.5	89	70	79.7	+1	97	5	59	11	18	0	68	73	4.71	-1.40	1.23	11	7	0	0	6.9	NE	31	N	9	6	11	14	6.5	57		
Mobile	10	1013.2	1017.9	90	72	81.2	+5	98	6	66	11	21	0	72	80	8.42	+1.13	2.09	13	10	0	0	8.4	SSW	---	---	---	5	12	14	6.6	--		
Montgomery CO	201	-----	1017.9	90	72	81.1	-4	97	6	66	11	18	0	71	75	5.77	+6.22	2.42	13	7	0	0	7.3	SE	43	E	11	7	15	8	5.8	67		
Montgomery	198	1010.2	1017.4	91	72	81.2	0	97	1	66	13	20	0	71	75	4.49	-1.27	1.19	13	7	0	0	5.3	SW	50	S	1	5	15	11	6.3	64		
ARIZONA																																		
Flagstaff	6993	791.4	1017.9	80	52	66.4	+1.2	90	2	45	1	2	0	---	---	2.50	+0.1	.65	18	25	T	T	---	---	---	---	3	7	21	7	6.1	--		
Phoenix CO	1083	-----	1017.9	80	50	91.5	+1.0	113	2	72	17	29	0	---	---	.74	+0.6	.52	4	7	0	0	7.2	---	---	30	E	29	---	---	82	---		
Phoenix	1114	971.6	1009.2	102	80	90.8	+7	112	2	72	17	29	0	63	44	.88	+1.8	.36	6	7	0	0	6.0	W	*33	SSE	12	13	12	6	4.8	--		
Prescott	5014	849.3	1013.6	89	62	75.3	-7	100	2	59	18	14	0	54	58	3.34	+6.3	.93	19	24	0	0	8.3	SW	41	SW	20	5	16	10	5.9	66		
Tucson	2558	924.8	1009.9	98	75	86.8	+6	110	1	69	17	29	0	61	48	2.87	+1.07	.85	13	22	0	0	7.3	SE	43	E	11	7	15	9	5.8	67		
Winslow	4880	853.0	1010.6	93	65	79.0	+1.8	101	1	61	19	25	0	51	47	1.99	+7.5	.64	11	13	0	0	7.8	WSW	*34	SSW	27	9	10	12	5.8	---		
Yuma	199	1003.4	1008.2	108	83	95.2	+2.4	113	1	76	1	31	0	61	35	T	---	---	---	0	2	0	0	11.2	SSE	37	S	24	22	6	3	2.6	88	
ARKANSAS																																		
Fort Smith	458	999.7	1017.0	92	71	81.1	-1.2	104	6	62	11	21	0	69	72	6.98	+4.42	2.32	8	12	0	0	6.6	NE	36	E	21	12	11	8	5.1	69		
Little Rock	257	1003.4	1017.4	92	72	81.9	0	101	6	64	11	21	0	68	68	1.19	-1.91	.50	8	7	0	0	7.5	SW	31	N	8	10	11	10	5.5	55		
Texarkana	361	1003.1	1017.3	91	72	81.3	-1.6	100	6	64	11	21	0	71	77	7.69	+3.75	3.14	10	11	0	0	5.7	NE	---	---	---	9	11	11	5	5.7	---	
CALIFORNIA																																		
Bakersfield	489	993.9	1011.2	101	70	85.1	+9	107	20	60	1	31	0	49	30	T	---	---	---	0	1	0	0	5.7	WNW	*18	WNW	25	28	3	0	7	---	
Beaumont CO	2589	-----	1011.2	97	61	78.7	+2.6	103	10	53	1	29	0	---	---	---	---	---	1	0	0	0	---	---	---	---	26	2	3	1	7	---		
Bishop	4108	873.4	1010.8	101	58	79.6	+4.1	105	6	45	3	31	0	---	---	.19	+0.9	.15	4	11	0	0	---	---	---	---	21	8	2	3	1	---		
Blue Canyon	5280	842.2	1012.9	80	61	70.1	+2.3	85	22	51	1	0	0	---	---	---	---	---	0	1	0	0	---	---	---	---	27	3	1	8	1	---		
Burbank	699	986.8	1012.8	90	63	76.2	+3.0	100	11	56	2	13	0	56	58	.00	---	---	0	0	0	0	4.0	S	*15	SSE	14	23	3	0	2	---		
Eureka CO	43	1015.6	1018.0	99	51	55.1	-1.3	69	13	47	6	0	0	---	---	---	---	---	0	0	0	0	6.7	---	---	20	N	15	7	12	15	5.8	50	
Fresno	331	999.0	1010.6	100	65	82.5	+4	105	21	55	1	31	0	52	39	T	---	---	0	0	0	0	6.0	NW	23	W	8	29	2	0	6.9	88		
Los Angeles CO	312	-----	1010.6	86	64	74.9	+2.4	98	12	59	2	6	0	---	---	.00	---	---	0	0	0	0	5.2	---	---	17	W	31	22	8	1	2	85	
Los Angeles	99	1009.1	1012.8	78	63	70.0	+2.8	89	13	57	5	0	0	60	74	.02	+0.02	.02	1	1	0	0	6.4	WSW	*23	W	20	16	14	1	3.1	---		
Mt. Shasta	3543	893.3	1015.1	86	51	68.7	+1.5	93	17	43	1	4	0	---	---	.00	---	---	0	0	0	0	---	---	---	---	30	1	0	5	5	---		
Oakland	3	1014.2	1014.5	73	54	63.6	+9	87	8	49	6	0	0	53	72	T	---	---	0	0	0	0	6.8	WNW	*19	WNW	17	25	5	1	2.2	---		
Red Bluff	341	999.0	1011.4	101	68	84.0	+8	105	11	60	1	31	0	49	32	.00	---	---	0	0	0	0	7.1	SSE	21	N	20	30	1	0	3.0	100		
Sacramento	17	1009.8	1011.5	95	58	76.5	+1.9	103	21	52	1	8	0	51	48	.00	---	---	0	0	0	0	8.6	S	25	SW	14	31	0	8	2.0	107		
Sandberg CO	4517	864.2	1012.4	88	66	77.0	+3.1	95	1	54	1	8	0	37	26	.00	---	---	0	1	0	0	13.5	NW	---	---	28	3	0	9	1	---		
San Diego	19	1009.8	1012.9	76	65	70.8	+1.5	84	13	60	4	0	0	61	74	T	---	---	0	0	0	0	6.7	SSW	17	SW	15	14	13	4	1.6	77		
San Francisco CO	52	-----	1013.9	64	51	57.3	-1.6	75	10	47	4	0	0	---	---	---	---	---	0	0	0	0	11.1	---	---	35	W	14	16	12	3	3.7	70	
San Francisco	1	1013.9	1014.5	70	50	60.1	-3	82	10	47	1	0	0	51	77	T	---	---	0	0	0	0	14.3	NW	36	WNW	13	28	2	1	1.7	---		
Santa Maria	231	1005.4	1013.7	74	52	63.4	+1.2	104	10	46	26	1	0	52	74	T	---	---	0	0	0	0	5.7	W	*18	NNE	10	21	9	1	3.2	---		
COLORADO																																		
Alamosa	7534	777.5	1019.1	82	50	66.0	+1.9	89	3	42	7	0	0	---	---	1.24	+3.37	.81	11	12	T	T	---	---	---	---	11	15	5	4	9	---		
Colorado Springs	6175	815.1	1015.2	85	58	71.8	+6	97	25	52	20	10	0	47	50	2.19	-5.42	.16	16	16	T	0	10.7	WNW	*30	WNW	15	13	1	7	4.8	---		
Denver	5292	839.5	1013.6	87	61	74.0	+1.2	96	3	56	8	12	0	49	49	1.98	+6.02	1.05	7	7	0	0	7.1	S	39	N	9	9	12	10	5.2	66		
Grand Junction	4849	859.8	1011.6	93	66	79.5	+1.3	101	4	60	12	23	0	46	36	.19	-0.00	.08	5	9	0	0	10.3	ESE	38	N	19	13	9	9	4.7	63		
Peublo	4799	858.8	1014.0	92	62	77.1	+2.2	103	25	55	23	20	0	52	50	1.72	-0.09	.63	8	14	0	0	6.9	WNW	36	SW	21	14	11	6	4.7	69		
CONNECTICUT																																		
Bridgeport	7	1015.6	-----	83	65	74.0	+1.2	95	17	55	10	4	0	---	---	3.71	-2.36	3.45	4	7	0	0	---	---	---	---	13	8	10	5	1	---		
Hartford	15	1010.5	1016.2	85	62	73.3	+6	97	18	52	25	8	0	61	69	4.24	-3.1	2.08	9	7	0	0	6.2	S	26	SW	2	11	8	12	5.5	79		
New Haven	6	1012.2	1015.9	81	63	72.1	+9	94	17	53	26	3	0	---	---	6.82	+3.16	4.29	8	5	T	T	---	---	---	31	N	1	12	9	10	5.3	74	
DELAWARE																																		
Wilmington	73	1013.2	1016.5	88	66	77.0	+1.1	100	18	56	25	12	0	64	66	3.21	-1.28	2.16	9	5	0	0	7.1	NW	---	---	---	10	14	7	4.8	---		
FLORIDA																																		
Apalachicola CO	13	1015.9	1016.9	88	75	81.8	+5	92	5	70	12	10	0	---	---	5.57	-1.99	2.59	9	13	0	0	6.7	---	38	SE	6	10	10	11	5.6	63		
Daytona Beach	33	1016.3	1017.8	91	72	81.5	+7	97	6	69	1	16	0	73	82	8.67	+1.56	3.36	18	22	0	0	8.8	SSW	*28	NNE	24	4	11	16	6.8	---		
Fort Myers	15	1016.9	1017.3	91	73	82.4	+4	94	2	70	23	28	0	74	82	9.34	+6.2	1.82	21	25	0	0	6.3	E	*25	S	17	1	17	13	6.8	---		
Jacksonville CO	18	-----	1017.8	90	75	82.6	+9	97	3	70	23	20	0	---	---	6.34	-1.55	1.65	21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Jacksonville CO	52	1016.9	1017.9	92	74	82.9	+8	100	3	71	14	23	0	72	77	9.30	+1.66	3.68	15	14	0	0	8.5	SW	33	NE	12	5	15	11	6.8	56		
Key West	5	1015.9	1016.6	90	78	83.8	+1	92	9	73	24	26	0	---	---	6.48	+2.24	1.97	12	8	0	0	6.3	---	26	NW	24	1	25	5	5.7	61		
Lakeland CO	214	-----	1017.2	91	73	82.0	+8	94	3	70	25	23	0	---	---	7.39	-7.7	1.36	19	27	0	0	---	---	---	---	---	---	---	---	---	---	---	
Leesburg	22	-----	1017.2	88	70	80.9	-2	9																										



## CLIMATOLOGICAL DATA

JULY 1953

Table 2-Continued

State and station	Elevation (ground) ft.	Pressure		Temperature										Precipitation										Wind				No. of days				
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max. 90° F. or above	No. of days Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days 1.0 inch or more	Snow, Sleet, Hail	Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine	
INDIANA (Cont.)																																
Terre Haute	585	995.3	1017.5	87	65	76.2	-0.7	97	30	52	11	11	0	66	68	4.27	+1.63	2.75	7	6	0.0	0	5.6	S	43	NW	6	17	7	7	4.0	8
IOWA																																
Burlington	694	992.2	1017.4	89	66	77.3	+5	99	5	51	9	15	0	64	65	1.37	-2.06	.48	5	11	.0	0	7.9	S	56	NW	5	12	14	5	4.5	87
Des Moines	948	986.1	1017.1	88	65	76.3	+1	97	28	53	10	13	0	64	70	1.71	-1.23	.62	8	9	.0	0	9.9	S	66	NW	2	12	10	9	4.9	78
Dubuque	1065	979.0	1018.1	82	63	72.0	-1.3	89	19	51	9	0	0	63	71	7.65	+4.24	3.58	15	14	.0	0	---	---	---	---	---	---	---	---	---	---
Sioux City	1093	977.3	1015.6	88	64	75.8	-5	99	25	49	9	12	0	63	68	.53	-2.39	.22	6	8	.0	0	7.4	ESE	30	S	24	12	11	8	4.7	78
KANSAS																																
Concordia CO	1375	966.5	---	89	68	78.5	-1.5	104	5	58	9	15	0	---	63	2.00	-1.39	.64	9	12	.0	0	7.3	---	20	SW	1	12	15	4	4.5	73
Dodge City	2594	928.2	1014.2	89	67	77.9	-2.0	106	4	55	12	16	0	62	64	1.18	-1.47	.44	10	9	.0	0	15.4	S	40	SW	1	12	13	6	4.8	77
Goodland	3645	889.6	1013.8	92	61	76.5	+9	106	1	52	12	17	0	58	59	1.41	-1.39	.72	8	9	.0	0	14.6	SE	*32	NE	7	15	11	5	4.2	---
Topeka	879	981.0	1016.2	92	66	79.2	-0	102	31	55	10	19	0	64	63	4.17	+9.2	2.15	7	7	T	T	8.8	S	60	N	4	10	18	3	5.1	74
Wichita	1372	968.2	1015.6	89	69	78.7	-2.2	104	5	57	11	14	0	64	65	2.39	-1.04	1.73	8	6	.0	0	12.5	S	42	SE	15	12	10	9	5.0	60
KENTUCKY																																
Lexington	978	982.7	1018.0	88	67	77.3	+1.6	98	31	55	11	12	0	65	69	3.67	-.58	1.16	9	8	T	0	7.3	SSE	---	---	---	13	9	9	4.6	---
Louisville CO	457	---	---	88	70	79.4	+8	92	2	61	10	12	0	---	---	4.83	+1.76	1.40	8	8	.0	0	---	---	---	---	---	---	---	---	---	---
Louisville	485	1001.0	1016.9	91	67	78.8	+9	98	2	56	11	19	0	66	68	5.40	+2.32	1.75	10	8	.0	0	5.5	SSE	42	SW	2	15	9	7	4.2	79
LOUISIANA																																
Baton Rouge	64	1013.5	1016.6	90	73	81.3	+2	95	8	67	12	22	0	73	80	5.45	-.42	.90	15	10	.0	0	5.7	W	---	---	---	5	11	15	6.6	---
Lake Charles	12	1014.9	1017.3	90	74	81.9	+3	97	9	67	12	17	0	74	82	11.73	+4.80	2.38	16	14	.0	0	5.6	W	---	---	---	6	12	13	6.5	---
New Orleans CO	3	1014.9	---	91	76	83.3	+2	95	2	70	13	19	0	---	---	10.98	+3.89	3.82	18	12	.0	0	5.3	---	25	NE	9	7	15	14	7.0	60
New Orleans	3	1014.9	1017.8	90	74	82.2	+4	95	5	71	13	21	0	74	79	10.44	+4.55	3.66	15	12	.0	0	7.3	SSW	*32	NNE	9	7	12	12	6.1	---
Shreveport	252	1007.1	1017.4	92	73	82.0	-1.6	98	9	67	11	21	0	73	77	3.03	-.67	1.28	12	9	.0	0	7.1	S	---	---	---	8	11	12	6.2	69
MAINE																																
Caribou	624	990.9	1013.8	75	53	64.1	+1	90	18	43	5	2	0	54	73	2.88	-1.15	.85	16	5	.0	0	9.9	S	*40	W	3	6	14	11	6.5	---
Eastport CO	33	1011.9	---	72	54	63.1	+2.5	89	17	48	12	0	0	---	---	5.31	+2.39	2.02	11	2	.0	0	8.3	---	3	NE	22	10	11	10	5.7	61
Portland	61	1010.8	1014.7	80	55	67.8	-0	96	17	44	11	1	0	59	73	2.57	-.26	1.33	6	3	.0	0	8.7	S	35	NW	3	6	15	10	6.0	69
MARYLAND																																
Baltimore CO	14	---	---	87	70	78.7	+2	97	17	59	11	12	0	---	---	4.54	+6.0	2.78	5	---	---	---	---	---	---	---	---	---	---	---	---	---
Baltimore	14	1012.5	1017.2	90	66	78.1	+1.1	100	17	56	11	17	0	63	63	4.94	+1.00	3.46	5	6	.0	0	8.1	NW	42	NW	2	14	14	3	4.3	83
Frederick	294	---	---	89	63	76.4	-3	100	18	51	11	13	0	---	---	2.57	-1.08	1.45	7	5	.0	0	---	---	---	---	---	---	---	---	---	---
MASSACHUSETTS																																
Blue Hill Obs.	640	992.9	---	80	61	69.9	+7	92	17	50	10	2	0	---	---	3.94	+2.3	1.88	12	4	.0	0	12.8	WNW	37	WNW	3	9	11	11	5.6	61
Boston	12	1010.8	1015.3	82	64	73.2	+1.0	96	17	57	25	4	0	59	66	2.76	-.42	1.16	9	9	.0	0	11.6	SW	34	NW	3	10	9	12	5.5	64
Nantucket	43	1015.2	1015.8	74	61	67.8	+7	85	17	52	6	0	0	62	83	5.86	+3.03	1.48	14	5	T	0	11.7	WSW	34	NW	24	8	15	6.4	60	
Pittsfield	1153	973.9	1015.6	79	56	67.1	-5	92	18	43	25	3	0	---	---	2.58	-2.37	1.37	8	5	.0	0	5.8	---	---	---	---	---	---	---	---	---
MICHIGAN																																
Alpena CO	587	994.6	---	76	59	67.4	-0	86	2	47	9	0	0	---	---	1.73	-.72	.96	8	6	.0	0	8.7	---	30	NW	1	9	16	6	5.1	76
Detroit	619	991.2	1017.5	83	64	73.5	+4	96	26	51	25	4	0	60	64	2.65	-.26	.81	6	5	.0	0	7.9	S	34	SW	2	8	15	8	5.4	72
Escanaba CO	594	994.2	---	76	59	67.5	+6	85	20	45	24	7	0	---	---	2.46	-.76	.57	8	4	T	T	8.3	---	38	N	2	11	13	7	5.0	71
Grand Rapids	681	992.2	1017.2	84	61	72.6	+1.1	92	16	47	24	7	0	60	66	1.34	-1.31	.32	11	9	.0	0	7.7	W	34	SW	26	9	12	10	5.6	77
Lansing	859	985.8	1017.6	84	60	72.0	+9	94	26	45	24	7	0	58	63	1.03	-1.25	.41	8	7	T	T	8.0	NW	40	W	7	10	14	7	5.0	78
Marquette CO	677	989.2	---	76	58	67.0	+9	87	16	46	23	0	0	---	---	2.17	-.96	.44	14	4	.0	0	7.4	---	28	S	21	10	12	9	5.5	72
Muskegon	627	994.2	1017.5	82	61	71.2	+1.3	93	16	47	20	4	0	59	62	2.87	+7.75	1.44	8	9	.0	0	---	---	---	---	---	---	---	---	---	---
Sault Ste. Marie	721	993.9	1016.6	75	53	63.8	-1	89	16	43	24	0	0	57	80	3.26	+7.7	1.03	10	6	.0	0	8.3	WNW	31	NW	2	10	14	7	5.1	67
Ypsilanti	722	989.2	1017.1	85	67	74.0	+5	95	26	50	24	10	0	59	63	2.98	+4.9	1.21	8	5	.0	0	8.4	NW	*32	W	2	9	13	9	5.5	---
MINNESOTA																																
Duluth	1409	974.9	1016.3	76	55	65.1	-6	86	16	44	3	0	0	56	75	5.68	+2.04	2.09	8	8	T	T	9.7	WNW	36	W	22	9	15	7	5.2	71
Intern'l Falls	1179	972.6	1015.3	78	51	64.5	-1.3	88	16	39	3	0	0	55	72	2.79	-.65	.77	13	7	.0	0	8.3	---	---	---	---	---	---	---	---	---
Minneapolis	830	983.7	1016.6	82	63	72.5	-1.6	92	16	52	8	2	0	60	68	6.81	+4.14	1.91	13	9	.0	0	9.4	SE	47	SE	20	10	12	9	5.4	60
Rochester	1017	980.0	1016.8	81	59	70.2	-1.6	91	19	46	10	3	0	60	73	6.95	+3.48	1.37	12	13	T	0	7.8	SSE	---	---	---	---	---	---	---	---
St. Cloud	1034	978.3	1016.0	81	58	69.3	-1.3	91	28	47	8	2	0	60	73	2.01	-1.04	.69	10	8	.0	0	6.8	NW	---	---	---	---	---	---	---	---
MISSISSIPPI																																
Jackson	315	1005.8	1017.4	93	72	82.4	+3	98	5	64	11	25	0	70	71	3.40	-1.21	1.92	9	7	T	0	5.8	SW	36	NE	27	7	12	12	6.2	57
Meridian	294	1003.4	---	91	71	80.8	-.1	97	5	61	11	20	0	---	---	6.49	+5.3	2.05	13	11	.0	0	---	---	---	---	---	---	---	---	---	---
Vicksburg CO	234	1007.8	---	90	74	81.9	+4	95	1	67	11	20	0	---	---	3.76	-.20	1.32	13	7	.0	0	7.1	---	27	SW	19	6	16	9	6.2	71
MISSOURI																																
Columbia	778	988.5	1017.5	91	67	79.0	+1.2	101	31	55	10	17	0	63	61	2.68	-.33	1.49	9	9	.0	0	7.5	SE	42	N	4	10	17	4	4.9	72
Kansas City	741	982.1	1017.3	92	71	81.2	+3	102	5	59	10	20	0	63	58	.96	-1.87	.42	8	4	.0	0	9.5	S	38	NW	5	9	18	4	5.0	81
St. Joseph	809	981.7	1015.9	91	67	79.1	-1.0	101	28	53	10	17	0	62	56	2.28	-.81	.85	5	5	.0	0	7.8	---	52	W	5	13	15	3	4.3	69
St. Louis CO	465	996.6	---	92	74	82.7	+2.1	102	31	64	10	22	0	---	---	7.2	-1.29	.38	5	5	.0	0	8.7	---	29	SW	14	12	12	7	4.6	84
St. Louis	552	996.6	1017.8	93	70	81.4	+1.7	104	30	59	10	21	0	63	59	1.31	-1.27	.85	6	4	.0	0	6.8	SE								



## CLIMATOLOGICAL DATA

Table 2—Continued

JULY 1953

State and station	Elevation (ground)	Pressure			Temperature										Precipitation										Wind				No. of days (sunrise to sunset)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal			Highest	Date	Lowest	No. of days Max. 90° F. or above	Average dew point		Average relative humidity		Greatest in 24 hours		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover: tenths (sunrise to sunset)	Possible sunshine																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
							Total	%	In.					In.	In.	In.	In.	In.	In.	In.	In.			In.	In.								In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.</



## CLIMATOLOGICAL DATA

Table 2—Continued

JULY 1953

State and station	Elevation (ground) ft.	Pressure			Temperature										Precipitation										Wind				No. of days (sunrise to sunset)		Sky cover, tenths (sunrise to sunset)	Possible sunshine																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max 90° F. or above Min 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days 0.1 inch or more With thunderstorms	Snow, Sleet, Hail	Max depth on ground	Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
TENNESSEE (Cont.)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			



## CLIMATOLOGICAL DATA

Table 2-Continued

JULY 1953

State and station	Elevation (feet)	Pressure			Temperature										Precipitation						Wind				No. of days (sunrise to sunset)		Possible sunshine									
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max 90° F or above Min 32° F or below	Average dew point	Average relative humidity		Departure from normal	Greatest in 24 hours	No. of days of inch or more With thunderstorms		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		Date		Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)					
														Total	In.			In.	In.	In.	In.			M. p. h.	M. p. h.							0-3	4-7	8-10	0-10	%
Ft	Mb	Mb.	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	In.	In.	In.	In.	In.	In.	M. p. h.	M. p. h.	0-3	4-7	8-10	0-10	%										
ALASKA																																				
Anchorage	134	1011.5	1016.8	70	51	60.5	+3.2	83	11	44	5	14	0	50	70	1.14	-0.41	0.59	8	0	0.0	0	NW	21	SE	15	9	5	17	6.6	54					
Admiral Island	110	1014.9	1018.9	63	52	57.5	+1.1	80	7	46	4	4	0	52	85	3.37	-2.77	.82	13	1	0	0	SSE	*35	SE	13	0	5	23	8.6	--					
Barrow	22	1014.2	1015.0	44	32	38.0	-1.7	67	19	27	26	0	21	36	94	.29	-.54	.14	10	0	0	0	WSW	39	SW	10	2	8	21	8.0	--					
Bethel	21	1014.2	1015.8	68	50	59.0	+4.5	82	27	44	23	13	0	52	78	1.33	-.96	.35	13	0	0	0	NNW	*21	NNE	11	5	7	19	7.3	--					
Cordova	40	1015.6	1017.4	63	47	54.9	+2.0	80	23	37	9	4	0	51	85	3.74	-1.37	1.06	16	1	0	0	SW	*17	ESE	7	3	6	22	8.3	--					
Fairbanks	436	997.6	1014.6	74	50	62.0	+2.1	89	30	42	3	17	0	50	68	1.37	-.53	.36	10	1	0	0	SW	18	SW	7	12	4	15	6.1	--					
Juneau	15	1016.6	1017.5	66	49	57.3	+2.6	80	25	42	21	7	0	50	80	2.95	-1.70	.71	20	1	0	0	N	19	SE	5	1	4	26	9.0	34					
Ketchikan	10	1014.2	1014.7	57	45	51.0	-2.2	76	30	34	4	3	0	47	88	1.66	+.22	.98	9	1	0	0	WSW	*31	W	3	6	6	19	7.0	--					
McGrath	334	1002.4	1014.9	73	50	61.5	+2.7	87	25	43	3	18	0	50	67	1.15	-1.27	.44	10	1	0	0	S	*19	SSW	20	4	12	15	6.9	--					
Nome	13	1014.6	1015.2	58	45	51.1	+1.2	75	27	34	17	4	0	46	81	3.41	+.95	1.69	9	2	0	0	WSW	26	W	4	4	11	16	6.8	48					
Sitka	1713	952.3	1015.1	72	49	60.3	+1.3	84	25	40	3	19	0	48	65	1.24	-1.80	.63	11	6	0	0	NW	*20	W	3	2	7	22	7.8	--					
St. Paul Island	22	1014.9	1016.1	54	44	49.1	+3.2	62	3	38	6	0	0	46	89	1.49	-.94	.50	14	0	0	0	---	---	---	4	4	23	8.1	--						
Yakutat	28	1017.3	1018.0	62	49	55.0	+1.7	75	10	41	5	1	0	52	88	2.50	-5.71	1.39	15	0	0	0	E	*22	W	7	2	6	23	8.6	--					

Data from airport unless otherwise specified. CO indicates data from city office.

\* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

° Other dates also.

† Peak gust.

# Max. 70°F. or above for Alaskan stations.

## HEATING DEGREE DAYS

(Base 65°F.)

JULY 1953

Table 3

State and station	Current season			State and station	Current season			State and station	Current season			State and station	Current season		
	This month	Period July through this month	Normals July through this month		This month	Period July through this month	Normals July through this month		This month	Period July through this month	Normals July through this month		This month	Period July through this month	Normals July through this month
ALABAMA				INDIANA (Cont'd.)				NEVADA (Cont'd.)				S. DAKOTA (Cont'd.)			
Birmingham	0	0	0	Indianapolis (CO)	0	0	0	Ely	6	6	22	Pierre	2	2	
Mobile	0	0	0	Indianapolis	1	1	0	Las Vegas	0	0	0	Rapid City	2	2	32
Montgomery (CO)	0	0	0	South Bend	6	6	5	Reno	4	4	27	Sioux Falls	6	6	16
Montgomery	0	0	0	Terre Haute	0	0	0	Tonopah	0	0	0				
ARIZONA				IOWA				Winnemucca	5	5	0	TENNESSEE			
Flagstaff	22	22	49	Burlington	1	1	0	NEW HAMPSHIRE				Bristol	0	0	0
Phoenix (CO)	0	0	0	Charles City (CO)	7	7	17	Concord	12	12	11	Chattanooga	0	0	0
Phoenix	0	0	0	Des Moines	0	0	5	Mt. Washington	489	499		Knoxville	0	0	0
Prescott	0	0	0	Dubuque	4	4	8					Memphis	0	0	0
Tucson	0	0	0	Keokuk (CO)	0	0	0	NEW JERSEY				Nashville	0	0	0
Winslow	0	0	0	Sioux City	0	0	8	Atlantic City (CO)	0	0	0				
Yuma	0	0	0					Newark	0	0	0	TEXAS			
ARKANSAS				KANSAS				Trenton (CO)	0	0	0	Abilene	0	0	0
Ft. Smith	0	0	0	Concordia (CO)	0	0	0					Amarillo	0	0	0
Little Rock	0	0	0	Dodge City	2	2	0	NEW MEXICO				Austin	0	0	0
Texarkana	0	0	0	Goodland	0	0	0	Albuquerque	0	0	0	Big Spring	0	0	0
CALIFORNIA				Topeka (CO)	0	0	0	Clayton	0	0	0	Brownsville	0	0	0
Bakersfield	0	0	0	Topeka	0	0	0	Raton	4	4	17	Corpus Christi	0	0	0
Beaumont (CO)	0	0	0	Wichita	1	1	0	Roswell	0	0	0	Dallas	0	0	0
Bishop	0	0	0									Del Rio	0	0	0
Blue Canyon	4	4	36	KENTUCKY				NEW YORK				El Paso	0	0	0
Burbank	0	0	0	Lexington	0	0	0	Albany	7	7	0	Ft. Worth	0	0	0
Eureka (CO)	300	300	267	Louisville (CO)	0	0	0	Binghamton	27	27	16	Galveston (CO)	0	0	0
Fresno	0	0	0	Louisville	0	0	0	Buffalo	9	9	16	Galveston	0	0	0
Los Angeles (CO)	0	0	0	Pikeville (CO)	0	0	0	New York (CO)	0	0	0	Houston	0	0	0
Los Angeles	1	1	31					La Guardia Field	0	0	0	Houston	0	0	0
Mt. Shasta (CO)	6	6	37	LOUISIANA				Rochester	14	14	9	Laredo	0	0	0
Oakland	56	56	84	Baton Rouge	0	0	0	Schenectady	0	0	0	Lubbock	0	0	0
Red Bluff	0	0	0	Lake Charles	0	0	0	Syracuse	11	11	0	Port Arthur	0	0	0
Sacramento (CO)	0	0	0	New Orleans (CO)	0	0	0					San Angelo	0	0	0
Sacramento	0	0	0	New Orleans	0	0	0	NORTH CAROLINA				San Antonio	0	0	0
Sandberg (CO)	0	0	0	Int. Airport, Moisant	0	0	0	Asheville (CO)	5	5	0	Victoria	0	0	0
San Diego	0	0	11	Shreveport	0	0	0	Asheville	0	0	0	Waco	0	0	0
San Francisco (CO)	233	233	189					Charlotte	0	0	0	Wichita Falls	0	0	0
San Francisco	144	144	144	MAINE				Greensboro	0	0	0				
San Jose	4	4	7	Caribou	82	82	85	Hatteras (CO)	0	0	0	UTAH			
Santa Maria	79	79	98	Eastport (CO)	74	74	141	Raleigh (CO)	0	0	0	Milford	0	0	0
				Greenville (CO)	54	51		Raleigh	0	0	0	Salt Lake City (CO)	0	0	0
				Portland	18	18	15	Wilmington	0	0	0	Salt Lake City	0	0	0
COLORADO								Winston-Salem	0	0	0				
Alamosa	24	24	64	MARYLAND								VERMONT			
Colorado Springs	4	4	8	Baltimore (CO)	0	0	0	NORTH DAKOTA				Burlington	8	8	19
Denver	0	0	0	Baltimore	0	0	0	Bismarck	17	17	29				
Grand Junction	0	0	0	Frederick	0	0	0	Devils Lake (CO)	36	36	47	VIRGINIA			
Pueblo	0	0	0					Fargo	20	20	25	Cape Henry	0	0	0
CONNECTICUT				MASSACHUSETTS				Grand Forks	31	31		Lynchburg	0	0	0
Bridgeport	0	0	0	Boston	2	2	0	Pembina	31	31		Norfolk (CO)	0	0	0
Hartford	0	0	0	Milton	15	15		Williston (CO)	23	23	29	Norfolk	0	0	0
New Haven	4	4	0	Nantucket	17	17	22					Richmond (CO)	0	0	0
DELAWARE				Pittsfield	44	44	25	OHIO				Richmond	0	0	0
Wilmington	0	0	0					Akron	11	11	0	Rosnoke	0	0	0
DIST. OF COLUMBIA				MICHIGAN				Cincinnati (CO)	0	0	0	WASHINGTON			
Washington (CO)	0	0	0	Alpena (CO)	36	36	50	Cincinnati	0	0	0	Ellensburg	5	5	13
Washington	0	0	0	Detroit	5	5	0	Cleveland (CO)	1	1	0	Kelso	90	90	85
FLORIDA				Escanaba (CO)	35	35	62	Cleveland	2	2	0	Olympia	95	95	91
Apalachicola (CO)	0	0	0	Grand Rapids (CO)	3	3	0	Columbus	0	0	0	Seattle (CO)	33	33	49
Daytona Beach	0	0	0	Grand Rapids	10	10	14	Dayton	0	0	0	Seattle	104	104	75
Fort Myers	0	0	0	Lansing	17	17	13	Dundusky (CO)	0	0	0	Spokane	11	11	17
Jacksonville (CO)	0	0	0	Marquette (CO)	43	43	69	Toledo	4	4	0	Tatoosh Island (CO)	276	276	295
Jacksonville	0	0	0	Muskegon	21	21	26	Youngstown	22	22	0	Walla Walla (CO)	0	0	0
Key West (CO)	0	0	0	Sault Ste. Marie	103	103	109					Yakima	8	8	0
Key West	0	0	0	Ypsilanti	4	4		OKLAHOMA							
Melbourne	0	0	0					Oklahoma City (CO)	5	5	0	WEST VIRGINIA			
Miami (CO)	0	0	0	MINNESOTA				Oklaoma City	5	5	0	Charleston	0	0	0
Int. Airport, Hialeah	0	0	0	Duluth (CO)	76	76	66	Tulsa	2	2	0	Elkins	18	18	9
Miami Beach	0	0	0	Duluth	57	57	56	OREGON				Huntington (CO)	0	0	0
Orlando	0	0	0	International Falls	76	76	70	Astoria	137	137	10	Parkersburg (CO)	0	0	0
Pensacola (CO)	0	0	0	Minneapolis	3	3	8	Burns (CO)	8	8	33	Petersburg (CO)	3	3	0
Tallahassee	0	0	0	Rochester	9	9	24	Eugene	39	39	33	WISCONSIN			
Tampa	0	0	0	St. Cloud	20	20	32	Meacham	100	100	88	Green Bay	19	19	32
WEST PALM BEACH				MISSISSIPPI				Medford	0	0	0	La Crosse	1	1	11
				Jackson	0	0	0	Pendleton	1	1	0	Madison (CO)	4	4	10
GEORGIA				Meridian	0	0	0	Portland (CO)	15	15	13	Madison	2	2	13
Albany	0	0	0	Vicksburg (CO)	0	0	0	Portland	32	32	25	Milwaukee (CO)	5	5	11
Athens	0	0	0					Roseburg	13	13		Milwaukee	2	2	20
Atlanta (CO)	0	0	0	MISSOURI				Salem	52	52	21	WYOMING			
Atlanta	0	0	0	Columbia	0	0	0	Sexton Summit (CO)	94	94	88	Casper	6	6	13
Augusta	0	0	0	Kansas City	0	0	0	PENNSYLVANIA				Cheyenne	10	10	33
Columbus	0	0	0	St. Joseph	0	0	0	Allentown	2	2	0	Lander	3	3	7
Macon	0	0	0	St. Louis (CO)	0	0	0	Erie (CO)	2	2	0	Rock Springs (CO)	0	0	0
Rome	0	0	0	St. Louis	0	0	0	Harrisburg	0	0	0	Rock Springs	1	1	20
Savannah	0	0	0	Springfield	0	0	0	Park Place (CO)	15	15	14	Sheridan	0	0	27
Valdosta	0	0	0					Philadelphia (CO)	0	0	0	ALASKA			
IDAHO				MONTANA				Philadelphia	0	0	0	Anchorage	140	140	
Boise	2	2	0	Billings	0	0	8	Pittsburgh (CO)	0	0	0	Annette Island	226	226	
Lewiston	0	0	0	Great Falls	21	21	24	Pittsburgh	5	5	0	Barrow	830	830	
Pocatello	0	0	0	Havre (CO)	19	19	20	Reading (CO)	0	0	0	Bethel	188	188	
ILLINOIS				Helena	11	11	36	Scranton (CO)	3	3	0	Cordova	305	305	
Cairo (CO)	0	0	0	Kalispell	67	67	47	Williamsport	2	2	0	Fairbanks	128	128	
Chicago (CO)	0	0	0	Miles City	1	1	6	RHODE ISLAND				Juneau	235	235	
Chicago	0	0	0	Missoula	27	27	22	Block Island	7	7	6	Kotzebue	428	428	
Chicago University	0	0	0	NEBRASKA				Providence	3	3	0	McGrath	133	133	
Moline	0	0	0	Grand Island	1	1	0	SOUTH CAROLINA				Nome	424	424	
Peoria	0	0	0	Lincoln (CO)	0	0	0	Charleston (CO)	0	0	0	Northway	156	156	
Springfield (CO)	0	0	0	Lincoln	0	0	0	Charleston	0	0	0	St. Paul	485	485	
Springfield	0	0	0	Norfolk	0	0	0	Columbia (CO)	0	0	0	Yakutat	304	304	
INDIANA				North Platte	0	0	7	Columbia	0	0	0				
Evansville	0	0	0	Omaha	0	0	0	Florence	0	0	0				
Ft. Wayne	0	0	0	Scottsbluff	0	0	0	Greenville	0	0	0				
				Valentine (CO)	7	7	11	Spartanburg	0	0	0				
				NEVADA											
				Elko	3	3	6	SOUTH DAKOTA							
								Huron	6	6	10				

Data from airport unless otherwise specified. CO indicates data from city office.



## SEVERE STORMS

Table 4

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Grand Rapids and vicinity, Minn.	1	A. m. and p. m.					\$40,000		Rains	Excessively heavy rains that accompanied severe thunderstorms flooded many basements, streets, roads, and highways. Sewers overflowed and culverts washed out. A 40-foot foundation of a new business building buckled and a 30-foot retaining wall of Junior High School washed out. Some damage to growing crops. At Grand Rapids, 6.06 inches of rain recorded.
LaSalle County, Ill.	1	1:30 p. m.					10,000	\$25,000	Wind and hail	Considerable wind damage in LaSalle - Peru area and near Ottawa. Hail damaged crops in southern part of County.
Warren, Pa.	1	Afternoon			1				Electrical	Boy killed by lightning as he was standing in doorway of his home.
Sarpy County (southwestern portion), Nebr.	1	3 p. m.	*2	8			5,000	95,000	Hail	
Rock Creek Canyon, Colo.	1	3:30 p. m.				1			Electrical	Man knocked to floor and slightly burned while talking on telephone.
Beaufort and Martin Counties, N. C.	1	4 p. m.			1	2	2,000	37,500	Hail and electrical	Farmer of Williamston killed in field by lightning. Wife and mother slightly injured. Most of crop and property damage by hail.
Circleville, Pickaway County, Ohio	1	6-7:30 p. m.	*15	10			13,000	2,000	Wind	Winds of 50 to 60 m. p. h. accompanied by heavy, low clouds, moved across central Pickaway County. Growing wheat leveled. Numerous buildings also damaged.
Indianapolis and vicinity, Ind.	1	P. m.			1		10,000		Electrical	Man killed by lightning and several houses or places of business damaged by lightning.
Arcadia (near), Nebr.	1	Evening					500		Wind	Several buildings damaged.
Sherman County (northeastern portion), Nebr.	1	8-9 p. m.					500	Several thousands	Hail and wind	Hay stacks scattered. Some small grain destroyed.
Boelus and vicinity, Nebr.	1	3:30 p. m.					2,000		Wind	Several buildings damaged. Haystacks scattered.
Saunders County (southeastern portion), Nebr.	1	11 p. m.	*12	11			Light	Considerable	Hail and wind	Crops damaged up to 50 percent.
Wisconsin, northern portion	1	Night					75,000		Wind and electrical	Utility lines, buildings, and trees damaged by wind and lightning. Damage reported in Iron, Bayfield, and Florence Counties.
Gladstone, Mich.	1						2100,000		Rain, wind, and electrical	Second heaviest 24-hour rainfall in recorded history along with lightning and high winds, damaged a number of buildings, blew off roofs, uprooted trees, and interrupted utility services. Washouts and flooded basements numerous. Losses from flooding and high winds about equal. Small percentage of loss to crops.
Iron River, Mich.	1						2125,000		Rain	3-1/3 inches of rain following about 10 inches in previous 2 weeks caused flooding in Iron River Basin. Hardest hit was Caspian. Homes, basements, and roadways flooded. Roads of Iron County suffered \$25,000 damage. Some crops drowned out.
La Porte, Harris County, Tex.	1				0	0			Tornado	Small tornado cloud sighted by observer at Ellington Air Force Base; did not touch ground.
Iowa, southern portion	2	Midnight to 6 a. m.					80,000		Wind	Windsqualls broke out after midnight in Pottawattomie County; trees damaged in Council Bluffs, barn and chicken house demolished, telephones out of order. At Des Moines drive-in theater screen demolished with damage of \$20,000 at about 3:30 a. m. Near Grinnell barn demolished and 7 planes at airport received major damages estimated at \$10,000. At 4:30 a. m. in Malcolm wind caused major damage to 2 buildings, broke windows on west side of buildings, and demolished a barn nearby and another near Guernsey. Local damage also reported in northern Johnson County in vicinity of North Liberty. From 5:30 to 6 a. m. tree damage and some damage to farm buildings reported in Muscatine and Scott Counties.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Southeastern Poweshiek and extreme southwestern Iowa Counties, Iowa	2	4:45 a.m.	*2½	25					Hail	Area affected extended from vicinity of Brooklyn to North English. Stones measured 8 to 10 inches in circumference. Heavy crop loss on 17 farms near North English.
Moline — Rock Island area, Ill.	2	6:45 a.m.					\$10,000		Wind and rain	Wind downed many trees and utility lines. Heavy rain flooded some streets and basements.
McLean County, Ill.	2	Morning			1	2			Electrical	Lightning killed 1 boy and injured 2 others at Lake Bloomington.
Lebanon, Dauphin and Cumberland Counties, Pa.	2	1-5 p.m.				2	°100,000		Electrical and winds	In Lower Allen Township in Cumberland County, high winds and lightning felled trees and wires, blocking highways. Lightning started at least 1 fire. In Lebanon, Cleona, and Annville sections of Lebanon County, high winds active. 3 sheds, a silo, and side of barn along with crops and equipment wrecked — estimated damage \$30,000. Barn roof peeled off and one-half a farm house ripped off. Many other buildings damaged by wind. Lightning disrupted power and telephone services, knocked Radio Station WLBR off air for nearly 4 hours, and set at least 1 fire. Crops in scores of fields flattened by winds; awnings ripped; windows broken; trees and wires damaged in all sections, blocking many highways. Weather Bureau Airport Station at Harrisburg reported gusts to 60 m.p.h., as winds damaged trees and utility lines.
Monument and Palmer Lake, Colo.	2	1:25-1:45 p.m.	*4	16	0	0	25,000	\$12,500	Hail, rain, and tornado	Storm ranged from mid-Palmer Lake to 1 mile south of Monument. Hailstones up to size of hens' eggs and accumulated on ground to depth of 2 to 4 inches. Storm severely damaged roofs, cars, crops, and windows. Funnel-shaped cloud observed at height of storm.
Nance County, Nebr.	2	1:30-4 p.m.	*¾	3 to 4				7,500	Hail	
Southern Platte and Goshen Counties, Wyo.	2	Afternoon	*4	30			20,500	100,000	Wind and hail	A few buildings destroyed by wind. Principal damage to crops by hail.
Athens County, Ohio	2	Afternoon and evening							Wind and electrical	Wind and lightning knocked out utility service in many sections and caused considerable damage in Amesville, Albany, Coolville, Mineral, and New England areas.
York (near), Pa.	2	Afternoon							Winds	Farm buildings damaged as winds cut 1/4 mile swath across farm property. Newspaper reported "baby twister", but no confirmation obtained.
Parkersburg and vicinity, W. Va.	2	Afternoon and evening							Wind and electrical	Damage caused by falling trees and limbs to power lines, residences, streets, and highways. Many television antennae blown down. 2 registered purebred Holstein cows valued at \$600 killed by lightning. Several cars damaged by falling limbs and signboards.
Aguadilla, Puerto Rico	2	2-4 p.m.	34				200		Wind	A severe squall which came off the ocean from the northwest hit center of Cristobal Colon Park in Aguadilla, within area about 1 block square. Over 20 trees, mostly about 6 inches to 1 foot, in diameter blown down. Also score board in baseball park blown down. Damage estimated at \$200.
Avery County, N. C.	2	2 p.m.						1,000	Hail	
Pittsburgh-Ligonier area, Pa.	2	4-5 p.m.							Electrical and winds	Winds, reaching 85 m.p.h. in gusts, caused much property, tree, and wire damage. Small plane ripped from its moorings and wrecked, with loss of \$3,000. Lightning struck relay station, knocking station WJAC-TV off air for ½ hour, and hit station's transmitter, reducing broadcast power. At Ligonier, lightning struck partially completed school, caved in wall and knocked holes in concrete floor—damage estimated \$50,000.
Kimball, southwestern Banner, and southwestern Cheyenne Counties, Nebr.	2	4:30-7 p.m.	*8 to 15	100			100,000	6,000,000	Hail and wind	

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Chugwater, Wyo.	2	6 p.m.			0	0	Light	\$0	Tornado	Tornado occurred 2 miles southeast of town. Damage confined to 1 uprooted tree.
Wheeling area, W.Va.	2	6 p.m.					\$500		Electrical	Damage estimated at \$500 to spire of church; other damage minor.
Upper Chesapeake Bay vicinity, Md.	2	Evening							Wind	Tree limbs and trees broken; signs smashed; utilities interrupted.
Towanda— Youngstown— Lewiston area, N. Y.	2	7-8:30 p.m.				2			Wind and hail	Thousands of dollars damage caused by thundersquall winds which may have reached 100 m.p.h. At Buffalo Airport 75 m.p.h. gusts reported. Hailstones size of walnuts broke windows. Winds demolished and damaged buildings, uprooted shade trees and orchards, and tangled utility lines. 2 persons cut by shattered glass. Crop damage only slight to moderate.
Logan, Phillips, and Sedgwick Counties, Colo.	2	7-8 p.m.	*25	45	0	0	1,500	Heavy	Wind, hail, and tornado	Southeastward moving storm caused 85 percent crop damage in path 12 to 15 miles wide. Funnel-shaped cloud observed during storm and touched ground at point northwest of Holyoke, but little damage resulted.
Sonora, N. Y.	2	P.m.					1,000		Electrical	Church steeple struck by lightning.
Batavia, N. Y.	2	P.m.					7,000		do	Barn and contents burned by lightning strike.
Burlington, Hunterdon, Mercer and Middlesex Counties, N. J.	2	P.m.					2,000	500	Wind, and hail	Tree limbs broken; TV antennae damaged; power and communications lines snapped. Some hail damage in Hunterdon County.
Montgomery, Ala.	2	P.m.					1,000		Electrical and rain	Bell Building was flooded in basement AFROTC headquarters on Bell St. where lightning apparently struck electrical wires. Several homes in Mobile Heights area flooded. Trees blown down and power services disrupted at various points.
Baca County (southwestern portion), Colo.	2	9-12 p.m.	*25	25			600	300	Wind and rain	Greatest damage to wheat and roads.
Annapolis and vicinity, Md.	2	9 p.m.			0	0			Wind (possible tornado)	Tree limbs and trees broken; signs smashed; utilities interrupted.
Jasper, Mo.	3	2 a.m.					15,000		Electrical	2 barns destroyed by lightning, with all contents, including hay, grain, tools, equipment, and 7 calves
Republic County (southern portion), Kans.	3	A.m.			0	0		0	Wind and tornado (possible)	Severe wind, described by newspaper as small tornado, destroyed garage implement shed and other farm buildings on farm near small town of Talmo and did similar damage at other farms 3 miles away. This was first of several locally severe storms developing in unstable air during 3-day period.
Verona, Mo.	3	Forenoon					6,000		Electrical	Barn and its contents of grain, hay, and machinery destroyed by lightning.
Loup County (southern portion), Nebr.	3	12-12:45 p.m.	*8	20			25,000	75,000	Hail	
Nohly (2 miles south of), Mont.	3	12:30 p.m.	*2	7				Some	do	Crop damage light, due to late planting.
Monticello, Ark.	3	12:45 p.m.					100,000		Electrical	Fire caused by lightning completely destroyed theater and contents.
Campbell, Mo.	3	Afternoon				6			do	6 members of 1 family knocked unconscious when tree under which they were standing was struck by lightning; one suffered serious burns and other injuries.
Hale, Mo.	3	Afternoon					2,500		do	Machine shed and all contents including tractor, combine, hay rake, and plow destroyed by lightning.
Greeley County (southern portion), Nebr.	3	1:30 p.m.	*20	20			Light		Hail and wind	Crops east of Scotia wiped out. Hail spotted.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Pamlico, Martin, Johnson, Lee, Guil- ford, Rock- ingham, Surry and Graham Coun- ties, N. C.	3	2-6 p.m.					\$10,000	\$300,000	Hail and wind	Widespread thunderstorm activity. Most crop damage was tobacco destroyed in fields. 20 square miles affected.
Merrick County (north- western portion), Nebr.	3	2:50 p.m.	*1	4 to 5			1,000	9,000	do	
Aline, Al- falfa Coun- ty, Okla.	3	3:30-4 p.m.	*3	4			5,000		do	Storm traveled northeastward. Numerous windows broken. Every building in town needs repair. Hail walnut to baseball size. Hail drifted and chickens frozen to death in drifts. Hail loss about \$2,500; wind damage about \$2,500.
Saunders County (southeast ern por- tion), Nebr.	3	4 p.m.	Nar- row	4 to 6	0	0	2,500	0	Tornado	
Malden, Mo.	3	5 p.m.					4,000		Wind	2 buildings demolished at airport, with slight damage to several small planes. Several houses damaged. 1 barn blown down.
Rawlins Coun- ty (south- ern por- tion), Kans.	3	Evening							do	Heavy winds damaged buildings on several farms, including destruction of roof and part of concrete walls of large barn.
Smith County (northeast- ern por- tion), Kans.	3	Evening							do	Buildings on at least 4 farms destroyed or damaged.
Sedgwick County, Kans.	3	Night					Slight		Hail	Hailstorm lasting nearly 45 minutes ruined crops and beat down electric wires in farm area 1 mile west of Maize.
Russell, Lincoln, Cloud, Clay, and Washington Counties, Kans.	4	3-5:45 p.m.			1	0	5,000	50,000	Wind, hail, electri- cal, and tornado	Scattered wind damage occurred along southwest to northeast line of squall-line thunderstorm activity beginning about 3 p.m. in southwestern Russell County and extending to southeastern Washington County. Several farm and outlying business buildings in Russell area damaged when near-tornadic winds developed. Near Barnard, in northeastern Lincoln County, man killed by lightning; slight wind damage reported. In eastern Cloud County, wind damage on 2 or 3 farms indicate tornado, which occurred about 4 p.m., in northeastward path about 1 mile long and 75 yards wide. Heavy rain prevented observation of funnel cloud, but roaring sound heard. In Clay County, from Clay Center northeastward, hailstones ranging upward to golfball size damaged crops in farm area. Severe wind destroyed or damaged farm buildings along southern part of Washington-Marshall County line. Property damage from tornado, crop damage from hail. Wind damage not estimated.
Iowa City, Iowa	4	9:02 p.m.				3	200,000		Wind	Wind struck while large crowd was gathered for 4th of July fireworks display. Very extensive tree damage; 2,500 telephones out of order; 4,000 to 5,000 homes without electricity; 30 automobiles smashed. About 2 miles southeast of Iowa City buildings on 4 farms demolished.
Iowa, ex- treme southeast- ern portion	4	Night					30,000		Wind and electri- cal	In Burlington, extensive tree damage, cars damaged, and glass broken. In nearby Denmark church steeple blown off. Near Milton 2 barns severely damaged. In Davis County 10 sheep and 3 cows killed by lightning.
Cedar and Muscatine Counties, Iowa	4	Night			1				Hail and electri- cal	Severe hail reported in vicinity of Cedar Valley, Atalissa, West Liberty, and Muscatine. Hailstones up to 2½ inches in diameter. Near West Liberty man killed by lightning.
Kingman Coun- ty, Kans.	4	9:30 p.m.					500	200	Electri- cal	Lightning set fire to shed 1 mile north of Kingman, burning it and contents of hay to ground.
Drexel, Mo.	5	1 a.m.					10,000		do	3 barns destroyed by lightning.
Peoria, Ill.	5	Early morning				8	5,000		Wind	Winds downed many tents at fair, seriously injuring 1 person.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Indianapolis and vicinity, Ind.	5	A. m.					\$100,000		Wind and electrical	Wind damaged a number of parked Army aircraft. Lightning destroyed first floor contents of store. Damage about 55 percent by wind, 45 percent by lightning.
Springfield, Ill.	5	10:35 a. m.					15,000		Wind	Wind downed many trees, damaging several cars. Several windows broken.
Colton-Baltic area, Min- nehaha Coun- ty, S. Dak.	5	11 a. m.	*2½	10					Hail	½ inch hail and winds with 40 to 70 m.p.h. gusts brought 10 to 70 percent damage to crops.
Iowa, north- western portion	5	12:15-2 p. m.	*2 to 7	100			\$ 4,250,000		do	Storm entered Iowa along Minnesota border north of Rock Rapids, moved east-southeastward through Osceola well into Dickinson County, picked up again 4 miles west of Fostoria in Clay County, and moved southeastward across Palo Alto County into Kossuth County. Largest stones size of golf balls. In western portion of path, hailstones collected in 10 spots to depth of 6 inches and in 1 place to depth of 18 inches where it persisted for 3 days.
Odell (near), Nebr.	5	Afternoon					2,500		Wind	Large barn destroyed.
Pittsburgh area, Pa.	5	1:30-3:30 p. m.			1				Electrical and rain	Locally heavy rains caused flash flooding in Turtle Creek area. Swimming pool, parking lot, and roads at Mineral Beach severely damaged by washouts from heavy cloudburst rains—damage estimate \$25,000. Lightning caused \$300 damage to wiring system in a house.
Iowa, east- central portion	5	2:30 p. m.	*1	9					Hail	Several localities affected including Van Horne to Newhall in southern Benton County, near Shueyville in northern Johnson County and in southeastern corner of that County, north of Muscatine and in extreme eastern Jackson County. Most severe along strip 9 miles long by 1 mile wide from Millersburg to North English in southern Iowa County. Stones up to 4 inches in diameter measured; 500 to 600 windows on north side of houses and buildings in North English broken.
Osborne County, Kans.	5	3 p. m.			0	0			Wind (tor- nadic)	Severe wind described as "small twister" moved a large barn from its foundation, destroyed cattle shed, and damaged buildings on at least 3 farms southeast of Osborne.
Thayer Coun- ty (central and eastern portions), Nebr.	5	3:15 p. m.	*3 to 5	20			9,500	34,500	Hail	
Waterloo, Cedar Falls, and vicinity, Iowa	5	3:20-3:30 p. m.				1	500,000		Wind	Wind at Waterloo Airport reached 100 m.p.h. in gusts. At Dairy Cattle Congress 4 brick buildings blown down; radio tower blown down; extensive tree damage; automobiles damaged; 4,000 telephones out of order; streets in western sections of Waterloo flooded. Southeast of Waterloo, near LaPorte, barn demolished 1 calf, 12 hogs, and 100 turkeys killed.
Iowa, south- ern portion	5	4-8 p. m.			1		90,000		Wind and electrical	Farmer in Guthrie County struck and killed by lightning. Windsquall about 4 p. m. destroyed barn near Shambaugh in southeastern Page County. Similar damage southwest of Cincinnati in Appanoose County. Near Lone Tree in southeastern Johnson County barn struck by lightning and burned. Near Bennett in eastern Cedar County barn destroyed, with loss of 4 cows and 6 hogs. Most extensive damage occurred in northern Lee and extreme southeastern Van Buren Counties. Near Farmington brick building destroyed. Near West Point 13 barns and 1 house severely damaged or destroyed.
Jewell and Republic Counties, Kans.	5	Late af- ternoon							Wind and hail	Severe wind in a northeasterly path from northeast of Jewell, in Jewell County, to Courtland area in western Republic County demolished, damaged, or unroofed buildings on several farms. No funnel cloud sighted, but damage suggested tornadic winds. Hail fell in local areas, causing slight damage.
New Windsor- Opheim area, Mer- cer and Henry Coun- ties, Ill.	5	5 p. m.					10,000	50,000	Hail	Heavy hail, some stones as large as baseballs, damaged buildings, automobiles, and crops.
Warren (near), Ill.	5				2				Electrical	Lightning killed 2 children.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Downs, McLean Coun- ty, Ill.	5	Evening			0	0	\$0	\$0	Tornado	Tornado funnel observed near Downs; did not reach surface.
Glennie, Mich.	5	Evening			0	0	500	0	do	A "small twister" jarred 5 houses and uprooted sev- eral trees.
Marshall, Mo.	5	Evening					5,000		Electri- cal	Farm residence destroyed by lightning.
Oregon, Mo.	5	6 p.m.					9,000		do	Barn and all contents including hay, grain, and machinery, destroyed by lightning.
Albany, Mo.	5	6 p.m.					2,000		Wind	3 houses damaged by wind.
Rock, Nobles and Jackson Counties, Minn.	5	P.m.	*10	60			50,000	300,000	Hail and rains	Moderate to heavy hail that accompanied severe thun- derstorm caused much damage to growing crops and considerable damage to real property. Hailstones unusually numerous and covered ground in places. Some hailstones size of golf balls. Some fields of corn, beans, and small grains reported to be total loss. Storm moved from west to southeast and was accompanied by heavy rains.
LaSalle - Peru area, Ill.	5	8 p.m.				1	10,000		Wind and rain	Many trees downed or damaged and utility services interrupted.
Topeka, Kans.	5	8 p.m.			0	3	106,800		Wind and torna- does	Severe wind, with local evidence of tornadic action and several unconfirmed reports of small funnel clouds, hit downtown Topeka, breaking at least 14 large plate-glass windows in business section, tear- ing off awnings, uprooting trees, breaking off large limbs, and blowing down power lines. Damage in hit- and-miss fashion over city, with some areas receiving very little wind. Twisted tree limbs in tops of trees in various sections on east side suggested ro- tary winds aloft. 3 persons injured by flying glass.
Streator, Ill.	5	8:30 p.m.					150,000		Wind	Heavy wind damage.
Decatur, Ill.	5	11 p.m.					5,000		do	Wind brought down many trees, damaging several homes.
Douglas Coun- ty (south- ern por- tion), Kans.	5	Night					1,000		Electri- cal	4 registered Jersey cows standing under tree killed by bolt of lightning.
Miami Coun- ty, Kans.	5	Midnight					3,000		do	Following lightning strike, barn and contents of mach- inery, grain, and hay burned to ground near Paola.
Clarksville, Montgomery County, Tenn.	6	3:30 a.m.			1		Slight	Slight	do	1 person killed by lightning while watering lawn.
Indianapolis and vicin- ity, Ind.	6	A.m.					100,000		Electri- cal and wind	Wind gusts to 75 m.p.h. blew down 1 barn and caused scattered damage. Lightning struck a number of barns, houses, and places of business, destroying or severely damaging some of them. Damage about 90 percent by lightning and 10 percent by wind.
Munising, Mich.	6	Noon							Wind	High winds blew down a 120-foot smokestack.
Cash, Ark.	6	3:45-4:15 p.m.	*1	2			4,000	3,000	Wind, electri- cal and hail	Several houses damaged, barn destroyed, and several outbuildings damaged. Small hail fell during storm. Cotton, rice, and soybeans damaged by hail.
Mt. Ida, Ark.	6	4 p.m.							Electri- cal and wind	1 home and 2 other buildings damaged by lightning. A few trees blown down. No estimate of monetary loss available.
Nashville and David- son County, Tenn.	6	4 p.m.					2,000	Slight	do	Some power lines blown down and trees uprooted in Nashville area. In Davidson County barn struck by lightning and burned; 90 bushels of barley and 400 bales of hay lost.
Willcox area, Ariz.	6	4-4:30 p.m.	*2	10			5,000	30,000	Hail and rain	Hailstones 1/4- to 1/2-inch in diameter fell, with heavy rain. Damage to cotton crop spotty.
LaRue Coun- ty, Ky.	6	P.m.			1				Electri- cal	Fatality caused by being struck by lightning.
McGinty Town Community, Faulkner County, Ark.	6	P.m.					9,000		Wind	Storm destroyed 1 house, unroofed 2 houses, damaged 6 others, and damaged or destroyed several other buildings.
Kirtley, Wyo.	6	5 p.m.					Light	Light	Wind and hail	Some power lines blown down.

See footnotes at end of table.



# SEVERE STORMS

Table 4-Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Stroud (3 miles north of), Lincoln County, Okla.	6	5 p.m.	100	**100	0	0	\$3,000	\$0	Tornado	Struck 1 farmstead, destroying 2 barns valued at \$3,000. Path northeastward.
Paragould, Ark.	6	5:14 p.m.					4,000		Electrical	1 house destroyed by fire resulting from lightning.
Okmulgee (1 mile south-east of), Okmulgee County, Okla.	6	5:25-6 p.m.	220	1	0	0	1,500	0	Tornadoes, hail, and wind	2 clouds observed which seemed to converge, 1 coming from northwest shaped like a funnel with long tail. Accompanied by hail $\frac{1}{2}$ inch in diameter. High winds caused considerable damage to utilities, TV antennae, chimneys, and roofs in Okmulgee. Damage by high winds, \$1,000. Tornado, which lasted only a few minutes, damaged 1 barn with estimated \$500 loss.
Russellville, Ark.	6	8-9 p.m.					110,000		Wind, electrical and rain	Storm damage confined to city limits of Russellville principal damage in business district where several business buildings unroofed, including telephone exchange. Considerable water damage to contents of unroofed buildings.
Hurdsfield, N. Dak.	6	3 p.m.			0	0	62,000	0	Tornado	Tornado came from northwest cutting very narrow path through center of town. All buildings in path damaged; 3 garages total loss. Chapel blown off foundation and twisted very badly. Some homes damaged severely. Many trees broken and twisted.
Box Butte County (west-central and southwestern portions), Nebr.	6	9 p.m.	*3 to 8	15				65,000	Hail	
West Plains, Mo.	7	7 a.m.					4,000		Electrical	Barn and contents, including new truck, feed, seed, and fertilizer, destroyed by lightning.
Freeport, Me.	7	12:45 p.m.	7		0	1	0	0	Tornado	Small twister dipped down in country area where men were working on road, swept up again over wooded area, carrying off some loose debris and inflicting minor cuts and bruises on 1 workman.
Morrill County (northern portion), Nebr.	7	Afternoon	*3/4	40			4,000	75,000	Hail and wind	
Ringgold (3 miles southwest of), Catosa County, Ga.	7	Afternoon	200	1			5,000	1,500	Wind	Storm, moving eastward, struck several points from Pleasant Grove Community to Taylor Ridge. Numerous trees blown down; 1 fell across TVA power line, damaging it and causing disruption of electric services in 2 communities. High winds lifted small garage from its foundation and deposited it 60 feet away on truck, causing heavy damage to both. Roofs of 3 barns, 2 homes, and garage torn loose. Extensive small damage to crops, with 5 acres of corn heavily damaged at one point.
Bluefield, W. Va.	7	3:45 p.m. to during night							Electrical and rain	Lightning damaged 88,000-volt substation seriously. Rain flooded streets to depth of 3 feet in places. Sewers and culverts could not pass water fast enough. Basements all over town flooded.
Maysville, Garvin County, Okla.	7	5-5:15 p.m.	440	1	0	0	2,000	0	Wind and tornado	Scattered light wind damage. Tornado funnel observed by many, but no damage. Path southeastward.
Mayfield (near), Beckham County, Okla.	7	5-5:25 p.m.	*1	4	0	0	5,000	8,000	Tornado and hail	Hail damaged crops; hail golf ball size or smaller. Tornado damaged buildings. Path northeastward.
Pueblo, Colo.	7	5:30-6 p.m.					25,000		Wind and rain	High winds, accompanied by heavy rains, damaged buildings, especially a new 28-unit motel under construction, fences, and signs. Downpour flooded basements, yards, and taxed drainage facilities.
Ushkosh (near), Nebr.	7	9:30-10:15 p.m.	*1	4	0	1	25,000	Light	Wind and tornado (possible)	Probably small tornado connected with this storm.
Reichert Community (southwest of Heaven er), Letlore County, Okla.	7	Late evening					1,000		Wind	Windstorm blew down much timber; also lifted some roofs from small buildings.

See footnotes at end of table.

## SEVERE STORMS

Table 4-Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Lonoke County, Ark.	8	A.m.					\$5,000		Electrical	Farm house 7 miles south of Lonoke destroyed by fire, resulting from lightning.
Dewey, Ariz.	8	2-9 p.m.	*2	5			150	\$1,750	Rains	Heavy rains for several hours washed away oats, hay, and fences; delayed traffic on Black Canyon Highway.
Between Peckham and Newkirk and southeastward to Kildare, Kay County, Okla.	8	3:40-5:30 p.m.	880	10	0	0	30,000	5,000	Wind, tornadoes and hail	Path southeastward. Some farm buildings blown down. In 1 cloud 3 tornado funnels observed 3 miles west of Ponca City Airport, at 3:40 p.m.; soon dissipated after causing about \$5,000 damage to farm property. Hail damage estimated at \$5,000 to crops; worst in Braman-Peckham area and southwest of Newkirk area, also in Blackwell area. High winds caused \$25,000 damage.
Oak Grove Community (southern edge of Birmingham), Ala.	8	P.m.							Electrical	6 room concrete block house struck by lightning. Sheet rock stripped from ceiling and walls of 3 rooms. Telephone knocked from wall and hurtled through oak flooring. Bolt also knocked out several windows, leveled top of chimney, and opened a hole in living room wall. Boy knocked half-way across room and 2 others knocked down, but no one severely hurt.
Sayreton Community (northern edge of Birmingham), Ala.	8	P.m.							do	Home struck, but little damage done. 1 person who was holding screen door open lost the feeling in his hands for over an hour. An elderly lady lying abed also shocked. At hospital man standing near window shocked.
Newbern (near), Ala.	8	P.m.							do	4-room house destroyed by fire following lightning flash, but no one hurt.
Fayette County, Ky.	8	P.m.						75,000	Hail and wind	Damage to corn and tobacco by hail and wind; estimates of crop damage ranged from nearly 100 percent downward to about 25 percent. Size of hailstones reported as large as golf balls. Practically all damage was by hail.
Sacaton, Ariz.	8	5-6:30 p.m.	*7	5			1,000		Wind	Power and telephone lines damaged by high winds.
Hector, Ark.	8	5:15-6 p.m.	880	3			500		do	Storm moved southwestward. Principal damage to buildings. Some corn blown down, but monetary loss not known.
Mechanicsburg-Dillsburg-Harrisburg area, Pa.	8	Evening							Winds and rains	High winds and locally heavy rains felled trees and utility lines, flooded low areas temporarily, and blocked some highways. Power and telephone facilities out for 2 or more hours.
Dorado, Puerto Rico	8	6 p.m.			1		5,000		Wind and wave	Strong easterly wave passed over northern portion of Caribbean. High winds, with gusts up to 48 m.p.h., broke high voltage wire at Dorado, Puerto Rico. As result man electrocuted by fallen wire.
Wilson County, N. C.	8	6 p.m.						13,000	Hail and wind	4 square miles damaged, mostly tobacco.
Sapulpa, Creek County, Okla.	8	6:15-6:45 p.m.	440	5 to 10			11,000		Winds and electrical	Damage by wind, \$40,000; by lightning, \$1,000. Damage to several buildings in business section. Old hotel so badly damaged it was condemned. Damage to several cars by falling brick.
Taloga (vicinity of), Dewey County, Okla.	8	7-9 p.m.					3,000		Wind	Several farmsteads damaged. Path southwestward.
Cumberland County, N. C.	8	8 p.m.					2,000		Electrical	Killed 2 cows. Damaged power lines.
Sayre (west of), Beckham County, Okla.	8	Night					1,000		do	Lightning killed 4 cattle on farm 4 miles west of Sayre. Lightning has also killed cattle in previous years in same pasture.
Anchorage, Alaska	9	5:05 a.m.							Volcanic dust-storm	Eruption took place from old ice-filled vent at elevation of about 7,000 feet on south shoulder of Mt. Spurr (11,070 feet) 80 miles west of Anchorage. Earliest observations of eruption made by pilots at 5:05 a.m. Huge ash cloud, which at 5:40 a.m. had extended from the mushrooming portion at an elevation of 32,000 feet at its base to 60,000 or 70,000 feet at its top, moved slowly eastward and by 11 a.m. the leading edge had spread over Anchorage. Difficulties of complete darkness, which lasted from 1 to 3 p.m., were compounded by much reduced

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Anchorage, Alaska (Cont'd.)	9									visibility caused by heavy fall of ash which averaged 0.2 inch deep on the ground in Anchorage. Ash continued to fall through remainder of afternoon and evening, but by early morning only a haze of dust hung over area. Each slight breeze swirled quantities of fine ash into air from trees and from ground. No serious effects on health of individuals, water supply, agriculture, or harm to animals noted.
Denver, Colo.	9	4:30-5 p.m.	*15	15		5	\$ 2,000,000	\$10,000	Rain and wind	Heavy downpour of from 1 to 4 inches in metropolitan area flooded streets, ripped up pavements, snarled traffic, and damaged telephone lines. Some sections inundated by 2 to 3 feet of water. Accompanying wind ripped branches from and uprooted trees, 1 landing on 2 automobiles.
Fordor, Colo.	9	Evening					5,000	Moderate	Rain, hail, and wind	Storm uprooted trees and flooded streams, roads, and highways. Crop losses heavy in limited areas. Hail on ground drifted to 2 feet deep in places.
Bonifay, Fla.	10	Afternoon			1	1			Electrical	Woman killed and another injured by lightning while working in a veneer shed. 4 others escaped injury.
Akron, Colo.	10	2:30-3 p.m.	*1/4	2					Hail	Hailstones, 1/2 to 1 inch in diameter, covered ground to depth of 1 inch. Damage comparatively light.
Park River, N. Dak.	11	Afternoon or evening			0	0	0	0	Tornado	Tornado cloud sighted, which apparently did not last long and did not touch ground.
Tucson, Ariz.	11	4:10-4:50 p.m.	*5 to 6	7			500		Wind and rain	High winds and heavy rains damaged some business buildings. Downtown underpasses flooded. Wind damage \$350; rain damage \$150.
Southwestern Beadle and northern Jerauld Counties, S. Dak.	11	5-6:30 p.m.	*12	40				80,000	Hail, wind, and rain	Thunderstorm activity in 480 square-mile area west and south of Huron caused average of 25 to 50 percent damage to crops. Unofficial reports of 4-inch rain near storm center.
Timpas, La Junta area, Colo.	11	6-8:50 p.m.			2		75,000		Rain	Flood water overflowed and damaged highways and railroad tracks. Racing farm suffered \$25,000 damage and 13 valuable dogs were drowned. 2 men assisting in rescue work drowned when boat capsized.
Frontier County (southwest- ern por- tion), Nebr.	12	Afternoon	*1	35			Light	1,000	Hail	Wheat (main crop) had been harvested.
Lyon County, Kans.	12	Afternoon						1,400	Electrical	70 tons of hay burned 11 miles northeast of Emporia as result of lightning strike.
Tilden (near), Nebr.	12	3:30 p.m.	*1 1/2 to 2	13			1,200	20,000	Hail	
McCook and vicinity, Nebr.	12	4 p.m.	*10	10			400,000	Moderate	Wind, rain, and hail	
Minneapolis- St. Paul and vicinity, Minn.	12	P.m.					50,000		Rains	Heavy to excessive rains that accompanied severe thunderstorm caused storm sewers to overflow and many basements, streets, roads, and highways were flooded. Traffic seriously delayed by deep pools of water in underpasses and at street intersections. Many automobiles stranded. Woman narrowly escaped drowning when trapped by rising waters in basement of store. Some damage to growing crops, but moisture beneficial.
Decatur, Thomas, and Logan Counties, Kans.	12	5 p.m.	*4 to 5	100			25,000	150,000	Hail	Long, narrow path of hail, which began in Nebraska near McCook, extended south-southwestward through Decatur County west of Oberlin, across eastern Thomas County through Gem-Mingo-Menlo area where damage heaviest, and into northern part of Logan County. Hailstones up to golf ball size damaged crops and property on several farms southwest of Oberlin and stones of 1 to 2 inches in diameter resulted in heavy loss in southeastern Thomas County. Storm path in trough of low pressure area centered in Minnesota.
Stanton County (north- eastern and east-central portions), Nebr.	12	6-6:30 p.m.	*2	6			5,000	70,000	do	

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Tucson, Ariz.	12	6:30-7 p.m.	*5	7			\$30,000		Wind and rain	Some flood damage to homes in low sections. Considerable damage to power and telephone lines by high winds, also to neon signs, roofs, and automobiles. Rain damage \$6,000; wind damage \$24,000.
Miami Beach, Fla.	13	Afternoon			1	1			Electrical	1 person killed and 1 injured while playing at water's edge on Miami Beach.
Hornell area, N. Y.	13	P.m.							do	Lightning-set fire burned barn near Canisteo, with estimated loss of \$3,000; also, burned an unoccupied house near Alfred Station.
Nemaha County (northwestern portion), Nebr.	14	3:30 p.m.	*2	2			500	\$9,500	Hail	
Tucson, Ariz.	14	4:30-7 p.m.	*5 to 6	7			350,000		Rain and electrical	Homes and stores and merchandise damaged by flood waters. Some windows broken, streets eroded, gas mains broken. Lightning damage to transformers and power lines. Damage by rains \$346,500; by lightning \$3,500.
Clatonia (near), Nebr.	14	5 p.m.	*3	14			1,500	25,000	Hail	Damage spotted.
Knob Noster, Mo.	14	6 p.m.					1,000		Electrical	Barn containing a small amount of hay and straw destroyed by lightning.
Warrensburg, Mo.	14	6 p.m.					2,000		do	Barn with 30 tons of hay destroyed by lightning.
Hugo (9 miles southwest of), Cherokee County, Okla.	14	6:30 p.m.			1	1			do	Brief electrical and duststorm; no rain fell in immediate area. Girl sitting under a tree killed and her brother with her injured.
Combes, Cameron County, Tex.	15	1:30 p.m.			0	0			Tornado	2 small buildings destroyed; 4 small buildings unroofed; auto trailer blown 40 feet.
Abilene, Tex.	15								Hail	Light damage.
Robert Lee (8 miles west of), Coke County, Tex.	15				0	0			Tornado	5 homes unroofed; school wrecked.
Sayre and New Liberty Community (northeast of), Beckham County, Okla.	15	Afternoon	*1/4 to 2	15 to 20			10,000	10,000	Hail and winds	Hail size of hens' to pullets' eggs hurled by a 50 m.p.h. wind damaged cotton and grain sorghums (estimated \$10,000) in a few minutes in New Liberty Community. Hail drifts 2½ feet deep. 2 barns and other buildings northeast of Sayre damaged. Other damage on 2 other farms near Sayre by straight wind.
Sedgwick County, Kans.	15	2:08 p.m.			0	0	0	0	Tornado	Tornado moving north-northwestward observed by several persons 2 miles west of Valley Center, dipped to ground briefly in open field before dissipating.
Allen County, Kans.	15	2:30 p.m.					3,000	500	Electrical	Large barn, tractor, farm machinery, and 700 bales of alfalfa hay burned following lightning strike 2 miles east of Iola.
Coffey County, Kans.	15	3 p.m.							Wind	Several buildings demolished in local windstorm in southeastern Coffey County.
Clyde Park (east of), Mont.	15	3:50 p.m.	*6	10				65,000	Hail	Damage to barley and wheat.
Briggsdale, Colo.	15	5:30-6:30 p.m.	*2	7					Moderate do	Storm in thinly populated area; hailstones small and did not accumulate to any noticeable depth on ground.
Walters and vicinity, Cotton County, Okla.	15	9:45-10:15 p.m.	*3	10			3,000	2,000	Wind, hail, and electrical	Hail damaged cotton and feed crops. Wind damaged farm buildings. Lightning struck house with minor damage.
Cheyenne County, Kans.	16	3:15-3:45 a.m.	*2	10				1,000	Hail and wind	Severe hail from about 5 miles northwest of St. Francis southeastward across Highway 236 to about 4 miles south-southeast of St. Francis, with small wind-driven stones of 1/4 inch diameter, mowed down crops, killed turkeys, and broke windows.
New Orleans, La.	16	Morning					500		Electrical	Lightning damaged home in eastern portion of city.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Torrey's Peak, Colo.	16	1 p.m.			0	0	\$0	\$0	Tornadoes and hail	2 funnel shaped clouds observed on Torrey's Peak — one on western slope, other on eastern slope of Continental Divide. Following shortly after clouds, hail fell to a depth of 4 to 6 inches. No damage resulted as storms were in isolated mountain section above 13,000 feet.
Tuttle (5 to 6 miles northwest of), Grady County, Okla.	16	1:19 p.m.			0	0	0	0	Tornado	A good sized funnel, revolving apparently slowly, headed northeastward over open country.
Medicine Bow Mountains, Wyo.	16	Afternoon			0	0	Light	0	do	Storm high in Medicine Bow Mountains and only reported damage to growing trees.
Maysville, Mo.	16	Afternoon					5,000		Electrical	Old church building destroyed by lightning.
Carthage, Mo.	16	2 p.m.					1,000		Rain	Flat-roofed office building collapsed under weight of water in heavy rain.
Nogales Patagonia, Ariz.	16	2-3 p.m.	*1	1			75,000		do	Flash floods destroyed highway bridge and damaged 4 homes.
Austin (vicinity of), Minn.	16	4:40 p.m.	*1½	6				50,000	Hail, winds, and rain	Moderate to heavy hail that accompanied severe thunderstorm caused much damage to growing crops and some damage to real property. Hailstones numerous and driven by strong winds. Some hailstones measured an inch in diameter. Some fields of soybeans, corn, and small grains almost total loss. Storm moved southeastward. High winds and moderate rains accompanied storm and caused some additional damage.
St. Johns, Ariz.	16	7:20-10:20 p.m.	*1	15			2,500		Rain	3 inches of rain fell in 3-hour period, resulting in washing out of private dam and damage to highways.
Barber County, Kans.	16	7:27 p.m.			0	0	0	0	Tornadoes	3 funnel clouds sighted from Sharon at same time. 2 small ones about 8 miles south; a larger one 10 miles west, which was also observed from Medicine Lodge. Latter cloud dipped to earth in open field, but rose again before reaching barn. Clouds distinguishable for about 3 minutes.
Phoenix, Ariz.	16	8-10 p.m.	*5	15		1	1,700		Wind, electrical, and rain	Lightning struck 3 homes, injuring 1 man. Irrigation canals overflowed, causing considerable washing of roadways; high winds blew trees onto power lines. Damage by wind \$200; lightning \$100; flood waters \$1,400.
St. Paul and vicinity, Minn.	16	9:30 p.m.					3,500		Electrical, winds, hail, and rain	Several places struck by lightning. 2 residences in St. Paul set afire, 1 of which sustained considerable damage. High winds, hail, and heavy rains accompanied storm and caused some minor damage to property and disrupted power and communication services.
Fort Worth, Tex.	16								Hail and wind	Hailstones up to 1 inch in diameter on south side of city.
New Orleans, La.	17	11:29 a.m.	34	4	0	2	50,000	0	Tornado and waterspouts	Occurred in northeastern portion of city, began as waterspout about Industrial Canal area and moved northeastward up Intercoastal waterway, developing into tornado when it reached land, then moved northeastward across U.S. Highway #90 and through Gentilly and Plum Orchard Communities. 1 church, 1 home, 1 warehouse, and several outbuildings destroyed; several homes and other outbuildings damaged; several trees twisted off. Left no path such as tornadoes generally do. Also 2 waterspouts seen on Lake Pontchartrain about 11:30 a.m.; no damage reported from them.
Albuquerque N. Mex.	17	P.m.					6,000		Rain	Principle damage to streets and roads from heavy runoff.
Mirana, Ariz.	17	6:30-7:30 p.m.					2,000	2,000	do	Heavy rains washed out concrete irrigation ditches and caused extensive damage to cotton crops.
Morrisonville, Wis. (vicinity of), Agona area, Ariz.	17	10:30 p.m.—midnight	*3	35			6,000		Wind and rain	Bridge under construction demolished by swirling waters. Homes damaged by high winds. Damage by rain \$1,000; wind \$5,000.
Milan, Mich.	18	7 a.m.					10,000		Electrical	Large barn struck by lightning and burned killing 3 riding horses.

see footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Whipple- ville, N.Y.	18								Electri- cal	2 barns struck by lightning and destroyed by fire.
Louisville, Ky.	13	P.m.					\$750		do	Lightning damaged church steeple and caused a few minor fires.
Detroit area, (Plum Brook Golf Course), Mich.	18	8 p.m.			1				Electri- cal and rain	Golfer killed by lightning while taking shelter un- der tree from rain.
Randolph (3 to 5 miles northwest of), Nebr.	19	Afternoon					Light	\$500	Hail	Damage spotted, area poorly defined.
Lamesa, Daw- son County, Tex.	19	2:45 p.m.	140	1½			25,000		Hail and wind	Only light hail reported. Glass in 20 buildings knocked out. Tin warehouses unroofed; power lines down; TV antennae twisted. Building used by high school unroofed.
Pueblo (5 miles east of), Colo.	19	3:20-3:25 p.m.	*1 to 1½	2			10,000	50,000	Hail	Damage mostly to crops, although power and telephone lines suffered somewhat.
Crosby Coun- ty, Tex.	19	4 p.m.	*2 to 3	15				150,000	do	Damage mainly to irrigated cotton and gardens, from small percent to total destruction. Started near Owens community in south-central Crosby County, and passed west of Crosbyton and northeast through Big Laur and Mt. Blanco communities. Largest hail 1 inch in diameter.
Beaufort, Pasquotank, and Onslow Counties, N. C.	19	4 p.m.					1,000	15,000	do	Slight damage over 20 square miles.
Stroudsburg, Pa.	19	Evening					25,000		Electri- cal	Lightning fired and burned hotel, barn, and truck shed.
Philadelphia area, Pa.	19	Evening				2			Electri- cal and winds	High winds, reaching 80 m.p.h. in gusts, downed large trees, which blocked highways and streetcars, dam- aged utility lines, broke many windows, and damaged other property and automobiles with flying debris. Lightning struck and damaged streetcar, felled 60 foot smokestack, and started at least 1 fire.
Dickinson (20 miles northeast of), N.Dak.	19	Evening	*3	15				180,000	Hail	Hail struck in area 3 miles wide and 15 miles long, causing considerable damage to crops. 1 observer described most of crop as total loss. Farmer said he measured up to 22 inches of hail in ditches after storm. Chickens killed and windows broken on sev- eral farms.
Wilmington, Del.	19-20	Night					Minor	Minor	Electri- cal	Chimneys damaged.
Wisconsin, southeast- ern portion	20	A.m.					200,000		Wind and electri- cal	Wind and lightning damage to buildings, trees, and utility lines in Kenosha, Racine, Milwaukee, and Waukesha Counties. Included in damage were: barn and contents destroyed by lightning-set fire in Milwaukee County; loss \$40,000. Power lines badly disrupted by 60 m.p.h. winds in City of Kenosha and parts of Waukesha County. Lightning caused con- siderable damage to power lines in Racine.
Polk County (northwest- ern por- tion), Minn.	20	A.m. and p.m.	*3	20			11,000	189,000	Hail and rains	Moderate to heavy hail that accompanied severe thun- derstorm damaged growing crops and real property. Hailstones unusually numerous and covered ground in places. Some hailstones reported to be size of golf balls. Some fields of small grains reported to be total loss. Storm moved southeastward. Heavy rains accompanied storm.
Morrison (near), Ill.	20	Noon					3,000		Electri- cal	Lightning stroke killed several cows.
Zumbro Falls and vicin- ity, Minn.	20	12:30 p.m.	*1	3			1,000	24,000	Hail and rains	Moderate to heavy hail that accompanied severe thun- derstorm caused considerable damage to growing crops and some damage to real property. Some hailstones reported to be size of walnuts. Storm moved south- eastward. Heavy rains accompanied storm.
Hooppole, Henry Coun- ty, Ill.	20	1 p.m.	880	4½				50,000	Hail	Hail heavily damaged crops on several farms.
Lonesome Lake, Mont.	20	2-3 p.m.	*2	20	0	0	0		Hail and tornadoes	Hail damage varied from 2 to 100 percent. 1 funnel clouds observed to north during storm; no damage.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Jefferson Community, Desha County, Ark.	20	2:30 p.m.			0	0		\$0	Tornado	Several persons watched funnel cloud demolish an old log barn. No other damage reported.
Scottsbluff (near), Nebr.	20	2:50-3 p.m.	Nar- row		0	0	\$750	Light	Tornadoes	End of path over sparsely settled territory. Several other tornadoes observed, which struck nothing of value.
Chester, Mont.	20	3 p.m.	*2	15				Consider- able	Hail	Damage to wheat, oats, and barley. Hailstones size of robins' eggs.
Hesperia, Mich.	20	3 p.m.					6,500		Electrical	Lightning and resulting fire destroyed a \$6,000 barn 2 miles south of Hesperia. Lightning caused minor damage in nearby areas.
New England (mainly in Massachusetts)	20	Late af- ternoon and night				1	5,000		Electrical, winds, and rain	Thunderstorms, locally severe, caused spotty damage, mainly from lightning. Power service interrupted in Nashua, N. H., and Holyoke and Westfield, Mass. Buildings struck by lightning, with resultant fires in Greater Boston, Chicopee, Lawrence, and Andover, Mass. Trees in Holyoke downed by thundersqualls, and landslide caused by heavy rain washed over railroad tracks there. 1 man stunned by lightning bolt in Chicopee.
St. Paul, Zambro Falls, and vicinity, Minn.	20	P.m.					1,500		do	A number of places struck by lightning which caused only minor damage. High, gusty winds and heavy rains accompanied storm and caused some additional damage. House damaged by falling tree; storm sewers overflowed; several persons rescued from stalled automobiles in flooded streets in St. Paul.
Hertford County, N.C.	20	5 p.m.						5,000	Hail	2 square miles damaged.
Delaware Water Gap, Pa.	20	Evening			1				Electrical	Man killed when struck by lightning as he was heading for shelter.
Shelby (east of), Mont.	20	6 p.m.	*1 to 2	10				10,000	Hail	Wheat and barley damaged.
St. Louis, Mo.	20	7 p.m.					75,000		Electrical	Large church badly damaged when struck by lightning.
Hopkins County, Ky.	20	9 p.m.						2,000	Wind and rain	Damage to growing corn and tobacco by wind during thunderstorm. Some additional minor damage to tobacco fields by heavy rainfall.
Whitewater, Wis.	21	Afternoon					2,000		Electrical	Lightning caused some damage to trees and power lines.
Long Lake, Oneida County, Wis.	21				1				do	1 person killed by lightning.
Outagamie County and northern Lake Winne- bago area, Wis.	21	Afternoon					100,000	10,000	Rain, hail, and wind	Heavy rain flooded several hundred basements in Appleton and Neenah. Hail destroyed 15 acres of corn and 25 acres of grain near Kaukauna; also, some damage to buildings. 2 large barns burned. Some stands of corn flattened by high wind. Power and telephone lines disrupted by lightning and wind.
South St. Paul (vicinity of), Minn.	21	3:30 p.m.			0	0	0	0	Tornado	Funnel-shaped cloud aloft sighted by observers at Holman Airport control tower in St. Paul. 2 airplane pilots also sighted funnel which appeared to be 15 to 20 miles south of Holman Airport. Cloud dipped close to earth from altitude of about 3,200 feet.
St. Paul Community, Howard County, Ark.	21	4:30 p.m.					1,200		Wind	House and barn damaged. Some damage to fruit trees.
Waco (near), Nebr.	21	4:30 p.m.	Nar- row	Short	0	0	1,100	0	Tornado	Small hangar and plane destroyed.
Grant City, Mo.	21	9 p.m.					1,000		Electrical	Barn with 10 tons of hay destroyed by lightning.
Billsburg area, Pa.	22-23	1 p.m., 22d - 3 a.m., 23d							Rain, winds, hail, and electrical	Nearly stationary thunderstorm activity developed over area from Churchtown, Brandtsville, and Dillsburg to Siddonsburg and Mt. Pleasant. Heavy rains over this area created sound like roar of large waterfalls. Amounts of 2 to 4 inches general over wide area, but over about 4-square mile area between Siddonsburg and Dillsburg 3.5 to 4 inches of rain fell by 3 p.m. and a total of 7 to 8 inches

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Dillsburg area, Pa. (Cont'd.)	22-23									fell by 5 p.m. Additional rains brought total up to maximum verified amount of 11.6 inches by morning of 23d. Soil erosion very heavy, piling up to 6 to 12 inches across roads. Many highways blocked by several feet of water. Crops and gardens damaged. Several periods of hail reported. About 2 hours of gusty winds did spotty local damage to trees and crops. Car and truck caught in sudden rise of water and carried downslope into group of trees. Covered bridge damaged by floating trees. Lightning fired barn which burned down, while firemen were trying to find a passable road to it. Flood-wave near mouth of Yellow Breeches 8 feet above average level.
Arlington County, Va.	22	4 p.m.					Minor	Minor	Thunder- storm	Chimneys and signs damaged; tree limbs broken.
Clear Spring, Md.	22-23						Minor	Minor	Rain and wind	Trees and limbs broken; outhouses and signs, etc., damaged.
District of Columbia and vicinity	22	4 p.m.					Minor	Minor	Thunder- storm	Chimneys and signs damaged; tree limbs broken.
Rosebud to Hidden Tim- ber, Todd County, S. Dak.	22	5-6 p.m.	*1 to 3	20				\$20,000	Hail	Eastward moving storm covered 40 square-mile area with 1/2- to 3/4-inch hail. Crop lands not extensive in this area, but those crops in area damaged considerably.
Pittsburgh area, Pa.	22	5-7 p.m.			3	1			Winds, electrical, and rains	Winds of near hurricane speed, accompanying severe thunderstorms, downed trees and disrupted power and telephone lines for periods in excess of 8 hours. Lightning caused minor property damage, started some small fires, and burned out several transformers. Man electrocuted by fallen "live" wire, and his wife injured. \$37,000 tent heavily damaged by high winds. Heavy rains flooded cellars in some sections and created flash floods. Skidding accident during heavy rain caused 2 deaths. Power company reported 7,500 customers without service, and telephone company reported 5,000 lines out of service from storm.
Beaver (near and south of), Beaver County, Okla.	22	5:15-6:15 p.m.	*3	6			\$500	400	Hail and wind	Hail $\frac{1}{2}$ to $1\frac{1}{2}$ inches in diameter covered ground 25 to 40 percent. Estimated damage is for hail; only minor damage by wind.
Seward, Meade, and southern Gray Coun- ties, Kans.	22	Evening							do	General storm conditions in southwestern Kansas resulted in at least 2 areas of damaging hail and 1 windstorm: (1) A 2 x 4 mile strip of hail with stones to size of golf balls about 5 miles north and 4 miles east of Liberal in which silo was damaged and windows broken. (2) Hailstones to size of golf balls damaged row crops near Meade. (3) Wind with tornadic characteristics struck northeast of Copeland, in southern Gray County, collapsing large shed, tearing up 4 haystacks, damaging other buildings, and uprooting trees.
Thurston, N. Y.	22-23	7 p.m.— 5 a.m.							Rain	Heavy rain fell over 10-square-mile area, causing flash floods. Highways badly washed and an earth slide caused 1 train wreck. Approximately 6.40 inches of rainfall reported at Thurston. Damage to crops light, to property considerable.
La Plata, Md.	22	Night					Minor	Minor	Electrical	2 tobacco barns burned.
New York City and Long Island, N. Y.	23	5 a.m.— 5 p.m.			1				Rain	Traffic disrupted by flooding, particularly in subways and in Long Island communities where numerous homes also flooded. Workman drowned while attempting to open clogged drain pipe.
Miles City, Mont.	23	5:20 a.m.	*2	7			300,000	6,000	Hail	Hailstones up to 1 inch in diameter.
Roosevelt County (be- tween Pop- lar and Culburt- son), Mont.	23		*4	18				250,000	do	
Bridgeport and vicin- ity, Conn.	23						150,000		Rain	Fairfield and New Haven Counties, Conn., deluged by very heavy rain; in 6 to 8-hour period centered about noon of 23d, 4 to 7 inches fell. Rooster River and other small streams rose; storm drains overtaxed; considerable street and cellar flooding damaged buildings, pavements, and stored merchandise.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Wheeling and Paden City, W. Va.	23	Late afternoon							Electrical	Lightning struck chimney of home in Paden City, causing estimated \$500 damage. Truck, skidding on wet street, struck utility pole, causing power failures in numerous homes.
Vida, Mont.	23	4 p.m.	*1	3 to 5				Moderate	Hail	Damage to 500 acres of wheat.
Morton County, Kans.	23	4-6 p.m.			0	0	\$500	\$1,500	Hail and tornado	Tornado cloud observed in northern part of County about 4 p.m. Hail with stones 1 to 3 inches in diameter fell in western Morton County and also about 3 miles north of Elkhart.
Savanna and vicinity, Pittsburg County, Okla.	23	5:30 p.m.				1	10,000		Wind	5 barns damaged; also extensive damage to other farm buildings.
Frederick, Tillman County, Okla.	23						1,000		Electrical, hail, and wind	Lightning did \$1,000 damage. Hail and high wind only minor damage.
Muskogee and vicinity, Muskogee County, Okla.	24	1:30-6 a.m.					Considerable		Electrical and rains	6 or 7 fires set by lightning. Lightning struck hospital with several hundred dollars damage, but no fire. Local floods from heavy rains closed highway west of Muskogee.
Durant and northern Bryan County, Okla.	24						Considerable		do	Lightning damaged hangar at Durant Airport; burned a hole through wall. Basements flooded, communications disrupted, and terraces and farm pond dams damaged as result of heavy rains.
Cushing, Payne County, Okla.	24	Morning					Considerable		do	Trees struck by lightning fell on roofs of 3 nearby buildings, with damage of several hundred dollars. Roads closed and minor damage to buildings on account of local flooding from heavy rains.
Orlando, Fla.	24	Noon							Wind	Gusts to 60 m.p.h. blew down power lines and highway patrol tower.
Crandon Park (near Miami), Fla.	24				1	2			Electrical	Girl killed and two others injured by lightning while on school picnic.
Lingle, Wyo.	24	Afternoon			0	0	Light	0	Tornado	Large tree uprooted on farm 4 miles northwest of town.
Marana, Ariz.	24	6:30-8 p.m.					10,000		Wind, rain, and electrical	Roofs of homes damaged by winds; trees uprooted; 2 partially constructed garages blown down; rain soaked interiors of homes and flooded streets. Transformer struck by lightning. Damage by wind \$8,000; rain \$1,000; lightning \$1,000.
Menominee, Mich.	25	A.m.					2,000		Rain and electrical	Over 4 inches of rain in short time caused flooded basements and back-up of sewers. Some power lines knocked out by lightning which accompanied storm.
Taft (near Orlando), Fla.	25	2 p.m.	17	**100	0	1			Tornado	Ripped side and roof from barn, pushed a 2-car shed over, knocked over trees, and stripped grapefruit from trees. Moved southwestward.
Rockvale, Mont.	25		*6	15				50,000	Hail	Damage to wheat, barley, and some peas.
Laurel (vicinity of), Mont.	25	5 p.m.	*6	4				75,000	do	
Campbell Farm Camp #4, Mont.	25	5:30-6:30 p.m.	*1 to 1½	1				75,000	do	2 separate storms during period indicated. Damage to wheat and barley.
St. Peter, Minn.	25	P.m.			1				Electrical	Lightning struck tree and killed farmhand who sought shelter beneath it.
Eagle Lake, Minn.	25	6:15 p.m.	67	½	0	1	100,000		Tornadoes and hail	A lumber yard and house demolished and a number of residences and business places damaged. Top of Commander grain elevator lifted and building twisted badly. Boxcar tilted over. Poles and wires down. A number of trees uprooted. Storm moved northeastward. 3 funnel-shaped clouds moving in different directions and merging into 1 huge cloud observed just before storm struck. Uprooted trees were lying in different directions. Heavy hail preceded storm. Occupants of house that was completely demolished were away. Splinters of wood found embedded in telephone poles and buildings.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Blue Earth, Waseca, Steele and Dodge Coun- ties, Minn.	25	6:15-9:30 p.m.						\$40,000	Hail	Moderate to heavy hail and severe thunderstorms caused considerable damage to growing crops. Some fields damaged from 10 to 40 percent. General direction of storm from west to east. At Eagle Lake, jagged chunks of ice fell and some hailstones measured 2 inches in diameter.
Chatfield (vicinity off), Minn.	25-26	P.m. and a.m.	*2	30			\$15,000	235,000	Hail, winds, and rain	Moderate to heavy hail that accompanied severe thunderstorms caused much damage to growing crops and considerable damage to real property. Hailstones numerous and in places ground entirely covered to depth of about 2 inches. Some hailstones measured 4 inches in circumference. Losses in some fields ranged from 60 to 80 percent. Storm moved north-northeastward. Heavy rains and high winds caused much lodging and considerable minor damage to real property and trees throughout extreme southern Minnesota.
Mildred, Mont.	25	7-8 p.m.	*3	20			Heavy	Severe	Hail	Several hundred thousand dollars damage to wheat and corn.
Colony, Wyo.	25	9:30 p.m.	* $\frac{1}{2}$	10				10,000	do	Storm lasted about 10 minutes.
Belle Fourche, Butte Coun- ty, S. Dak.	25	10:30 p.m.	*5	50			\$500,000		Hail and wind	Storm moved southeastward covering a tri-state area from Vale, S. Dak., to Bear Lodge to Alzada, Montana. With 1-inch hail in Belle Fourche, 200 school windows broken and roofs damaged. Damage to schools estimated to be thousands of dollars. Windows, roofs, and cars around town badly damaged. Damage to crops and farm buildings in area expected to be much higher. Power lines twisted by falling trees.
Wisconsin, central and northern portions	25-26						75,000	10,000	Rain, wind, and electric- cal	Heavy rain and wind caused scattered damage to crops. Heavy rain damaged roads and small bridges. Lightning killed some livestock and disrupted power lines.
Nettleton, Ark.	25				1				Electric- cal	Man killed by lightning while working in field.
Madison and vicinity, Minn.	26	A.m.					20,000		Electric- cal, rains, and winds	A number of places struck by lightning. At Madison, Municipal Light Plant smokestack struck and lightning traveling down into building burned out generator. Heavy rains and high winds accompanied storm and caused considerable minor damage.
Iowa, west central portion	26	2:30-6 p.m.							Hail	Several short strips affected, most serious being 2 miles wide and 12 miles long extending from south of Battle Creek to 4 miles west of Schleswig. Second strip in vicinity of Ricketts extended south-southeastward to east of Charter Oak to vicinity of Dow City. These storms occurred about 2:30 p.m. About 6 p.m., hail fell in strip 1 mile wide and 4 miles long extending west to east between Soldier and Moorhead. Stones irregular in shape and measured up to 5½ inches in diameter.
Scribner (west of), Nebr.	26	Late af- ternoon			0	0	500	Light	Hail and tornado	
Columbus, Nebr.	26	Evening			0	0	2,500	Little	Wind, hail, and tornado (pos- sible)	Possibly a small tornado in this storm.
Cairo (near), Nebr.	26	Evening		6	0	0	Little	Consider- able	Hail and tornado	Tornado funnel observed, but did not descend to ground.
Prosser to Wood River, Nebr.	26	7 p.m.					2,500	Consider- able	Hail and wind	
Palacios, Matagorda County, Tex.	27	10:28 a.m.			0	0			Tornado	Tornado east-southeast of Palacios, moving west; did not touch ground.
Boulder, Colo.	27				1				Electric- cal	Telephone lineman struck by lightning and killed while working on pole in Boulder Canyon.
Redfield, Spink Coun- ty, S. Dak.	27	Night							Wind	Wind blew down trees or tree limbs in Redfield which caused considerable damage to parked cars, communication and power lines, and porches and roofs on houses. Side of concrete-block building, which was broadside to the wind, pushed in.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Vineyard Haven and Oak Bluffs, on Martha's Vineyard, Mass.	27-28	Midnight	*1	5			\$10,000	Several thousand dollars	Hail	Moving northeastward across northern part of Martha's Vineyard, hailstorm smashed windows, damaged porches, roofs, and automobiles, in addition to lawns, trees, and gardens. Several greenhouses hard hit. Property losses mainly small (broken windows mostly) but numerous.
Vida (southwest of), Mont.	28	1 a.m.	*2	4					do	Damage to wheat from 5 to 100 percent.
Agua Dulce, Nueces County, Tex.	28	10:15 a.m.	67	1	0	0			Tornado	Small weak tornado occurred 2 miles east of Agua Dulce over open farm ground; no damage.
Sioux County (northern portion), Nebr.	23	Afternoon	*3 to 5		0	0	2,500	Considerable	Hail and tornado	Storm moved into uninhabited country, thus length of path unknown.
Center, Colo.	28	2-2:15 p.m.	*2	2				\$10,000	Hail	Hailstones ranged in size from 1/4 to 1/2 inch and accumulated on ground to depth of 1 inch. Damage totally to growing crops.
Albert Lea and vicinity, Minn.	23	5 p.m.				5	7,000		Wind and rain	Warehouse damaged; trees uprooted; radio tower and television antennae blown down and communication and power services disrupted. Falling tree crashed through roof of house and into kitchen injuring 5 members of family. Heavy rains accompanied storm which moved southeastward.
Sycamore (near), Ill.	28	11:30 p.m.		1			5,000	25,000	Wind and hail	Hail damaged crops. Wind downed many trees.
Portland (5 miles northeast of), Mich.	29	4 a.m.					20,000		Electrical	Lightning and resulting fire destroyed barn, 1,000 bales of hay and straw, 14 head of cattle, and 125 chickens. Lightning struck another farm, killing 6 cows.
Hesperia (8 miles west of), Mich.	29	6 a.m.					8,000		do	House struck by lightning and burned to ground.
Bisbee-Lowell-Warren area, Ariz.	29	11:40 a.m.-12:45 p.m.	*2	6			16,500		Hail	Hailstones, averaging 1/2- to 3/4 inch in diameter, riddled roofs and broke windows, causing extensive damage to homes.
Double Four Ranch (near), Wyo.	29	Afternoon							Rain	Heavy rain caused local flooding. Serious damage to fences, irrigation ditches, and small bridges.
Palmer Lake to Peterson Field area, Colo.	29	2:47-10:15 p.m.	*5	15			Light	Light	Rain and hail	Rain heavy over greater portion of area, with some spotted heavy hail. Storm slowed traffic and slightly damaged railroads, highways, and other property.
Marana vicinity, Ariz.	29	3:40-4:20 p.m.	*2	10			10,000		Wind and rain	Buildings collapsed from strong winds. 1 airplane torn from its moorings and badly damaged. Wind damage \$9,500; rain \$500.
Berne, Ind.	29	P.m.					25,000	1,000	Wind	1 barn destroyed, others damaged; trees down; some corn flattened.
Safford vicinity, Ariz.	29	4:30-5:30 p.m.	500	5	1				do	Minor property damage by high winds. Girl killed when shack collapsed due to winds. Safford Airport recorded winds of 60 m.p.h.
Eloy, Ariz.	29	4:30-10 p.m.	500	2			50,000		Electrical	Lightning burned out 10,000 KVA transformer.
Hayden Junction, Ariz.	29	5:45-6:30 p.m.	*1	3	1				Rain	Man crossing wash on horse back was swept off by flash flood and drowned.
Santa Fe, N. Mex.	29						75,000		do	Erosion of streets from heavy runoff; lawns and some buildings damaged.
Greene and Fayette Counties, Pa.	29	Evening				1			Electrical and winds	Lightning damaged 1 barn; burned a second barn with loss of \$15,000. 1 fireman overcome. High winds caused tree and wire damage throughout area.
Kaycee, Wyo.	29	Night					2,000	Light	Rain	Heavy rain caused heavy flooding at ranch 17 miles west of Kaycee.
New Orleans, La.	30	12:30 p.m.					40,000		Electrical	Lightning damaged home in western portion of city.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

JULY 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Telephone Canyon (east of Laramie), Wyo.	30	Afternoon			1	1	\$25,000		Rain	Flood waters in canyon caused approximately \$25,000 damage to highway #30. Car washed into ditch, killing 1 person and injuring another.
Chugwater, Wyo.	30	Evening					30,000	Light	do	Flood waters washed out railroad tracks, 2 bridges on highway #87, and flooded main street in Chugwater with more than 4 feet of water.
Wolf Point Airport, Mont.	30	7 p.m.			0	0	Considerable	\$0	Hail and tornado	Planes damaged as hangar roof collapsed. Part of roof carried some distance away. Brick walls of hangar cracked.
Roosevelt County (western portion), Mont.	30	7 p.m.	*2	6				200,000	Hail and wind	\$40,000 wind damage.
Scobey (south of), Mont.	30	8-8:30 p.m.	*5	5					Hail	Damage to wheat from 35 to 100 percent.
Redstone, Mont.	30	9-10 p.m.	*2 to 3	6 to 8				Light	do	Wheat, oats, and barley damaged.
Hill, Mont.	30-31		*5	10				Light	do	Hailstones 3/8 inch in diameter.
Springfield (near), Ill.	31	2 p.m.			1				Electrical	Man killed by lightning.
Martin County, Ky.	31	2:30 p.m.						2,000	Wind	Damage principally to corn and timber.
Jefferson County, Ky.	31	P.m.					4,000		Electrical	1 home completely destroyed by fire as a result of being struck by lightning.
Geraldine, Mont.	31	4 p.m.	*2	3					Hail	Damage to wheat 13 percent.
Cheyenne County, Kans.	31	6 p.m.			1		200		Electrical	Man and 3 horses killed by lightning bolt northwest of St. Francis.
Circle (west and north-west of), Mont.	31	7 p.m.	*3	6				150,000	Hail	Hailstones 1/2 inch in diameter.

\* Miles instead of yards.

\*\* Yards instead of miles.

° Crop damage included with other property damage.



# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

JULY 1953

Overflows during July were mostly of a local nature and confined largely to tributaries and creeks. The heaviest damages occurred along the upper Minnesota River which continued in flood from June 28 to July 11 and was mostly to growing crops along the river. The Rio Grande continued dry from above Laredo to Brownsville, Tex., and the Gulf most of the month.

**EAST GULF OF MEXICO DRAINAGE.**—Heavy rains during the third week of July caused moderate rises in the Apalachicola River system during the latter part of the month. Crests were considerably below flood stage at all stations except Blountstown, Fla., on the Apalachicola River where above flood stage occurred during the period from the 25th to the 31st.

**UPPER MISSISSIPPI.**—Excessive rains of a local nature caused flooding in the Upper Iowa, Root and La Crosse Rivers in Iowa, Minnesota and Wisconsin respectively. Local flooding in the lower part of the La Crosse River took place on the 20th and 21st when 2.9 inches of rain fell in a short period of time at and around West Salem, Wis. As a result pasture lands were flooded and local gardens damaged to some extent along with lodging of grain and corn maturing in the fields.

Floods in the Upper Iowa in northeastern Iowa on the 25th and 26th were much more serious. Scattered areas in this valley received 4 to 5 inches of rain in this period of time. At Decorah, 5.38 inches fell in the two day period. The Upper Iowa rose from 2 to 4 feet above bankfull stage in some places flooding considerable agricultural land with large acreage of corn, grain, and soy beans.

Another area of flooding occurred in the Root River Valley on the 27th which was of short duration resulting from excessive rains of the thunderstorm type. This flood affected the middle and lower ends of the Valley flooding low lying agricultural lands where corn was maturing. High water covered highway 26 near the mouth of the river. Another flood followed shortly with rainfall averaging 4 inches during the last two days of July. This caused a greater rise in the Root River due to high percentage of run-off from soil already heavily saturated. Minor flooding occurred on the Zumbro River, also on the White-water. The total rainfall for July was a record high for La Crosse, Wis., (11.15 inches) being 2.5 times the normal amount. The previous greatest total for July occurred in 1883 with 11.03 inches.

**Missouri Basin.**—Overflow stages in the Missouri Basin were confined to tributaries of the Republican and Solomon Rivers. Light to moderate flooding took place on the lower portion of the North Fork of the Solomon River on the 20-21st. On the Republican tributaries, there was a light overflow on Prairie Dog Creek in the vicinity of Norton, Kans., on the 20th and also on Red Willow Creek at Red Willow, Nebr., on the 11th. The Republican reached bankfull at Cambridge, Nebr., during the night of the 12-13th.

Rises were generally due to heavy localized rainfall. On the 11th about 3 inches of rain fell in the McCook, Red Willow, and Indianola, Nebr., areas with a diminishing trend to near 2 inches at Palisade, Culbertson, and Cambridge, Nebr. A local shower on the afternoon of the

12th at McCook, Nebr., amounted to 1.73 inches in 30 minutes. Heavy local rains on the night of the 19-20th in north-central Kansas ranged up to 6.09 inches at Norton. These rains produced the principal rises which occurred on Prairie Dog Creek and the North Fork of the Solomon. Damages were negligible except for some losses along the North Fork of the Solomon River.

**Ohio Basin.**—There were three flash floods in the Pittsburgh, Pa., area during the month. The first occurred on Turtle Creek on the 5th due to a severe thunderstorm. Two more flash floods occurred in the area on the 19th and 22d due to severe thundershowers.

There was a flash flood on Three Creeks in Pike County, Kentucky, north and east of Pikeville on the 5th and 6th of July. The rain began shortly before midnight on the 5th and continued into the 6th with the heaviest rain between 1 and 2 a.m. on the 6th. One death resulted from this flood and several thousands of dollars damage to growing crops and bridges.

This same storm caused local flooding on the Wabash River at Montezuma, Ind., on the 7th and 8th. Rainfall on the 5-6th averaged 2 to 3 inches over the Wabash and White River Basins except along the lower Wabash from Vincennes to New Harmony where the rainfall was very light. No damage resulted.

**Red Basin.**—Minor flooding occurred on the Little River at Whitecliffs, Ark., between the 25th and 28th. No damages were reported.

**WEST GULF OF MEXICO DRAINAGE.**—Heavy local showers in the Albuquerque, N. Mex., area during the afternoon of the 17th caused some flooding of arroyas in the northeastern section of the City. Damage was confined mostly to streets and roads and was estimated at \$6,000. Heavy showers also fell during the late afternoon and evening of the 17th over the Galisteo Creek watershed some 30 to 40 miles north-northeast of Albuquerque causing a considerable rise in that normally dry stream. This inflow into the Rio Grande above Bernalillo caused a considerable rise and on the morning of the 18th a crest stage of about 5 feet occurred at Albuquerque. This was 1 foot above bankfull stage but no damages resulted as the heavy flow was of short duration and was confined within its banks.

Heavy showers (3 inches) on the 29th over the Santa Fe Metropolitan Area caused overflow along Santa Fe Creek resulting in some damage to streets and street crossings.

The Rio Grande continued dry from above Laredo to Brownsville, and the Gulf for most of the month. About the middle of the month some rains fell in the watershed above Laredo and started some flow past Laredo about the 15th. Additional slight showers above Laredo continued this flow the balance of the month. A small amount of this flow reached the Rio Grande City - Hidalgo area, but none came on into the lower Valley below Hidalgo. The flow at Hidalgo was quickly stopped with the construction of a weir dam to divert the meager flow that existed in the Anzulduas Canal of Mexico.

Minor flooding occurred on the Sabine River at Mineola, Tex., on the 23d due to the numerous showers between the 10th and 27th.

# FLOOD STAGE DATA

(All dates in July unless otherwise specified)

JULY 1953

Table S

River and station	Flood stage	Above flood stages -dates		Crest*	
		From-	To-	Stage	Date
EAST GULF OF MEXICO DRAINAGE					
Apalachicola: Blountstown, Fla.	15	25	31	15.5	26 & 27
MISSISSIPPI SYSTEM					
<u>Upper Mississippi Basin</u>					
Minnesota: Montevideo, Minn.	14	June 28	11	16.1	1
Zumbro: Theilman, Minn.	38	27	28	40.7	27
Root:					
Houston, Minn.	15	27	27	15.1	27
Hokah, Minn.	48	27	27	48.6	27
Upper Iowa: Dorchester, Iowa	11	27	28	19.2	26
<u>Missouri Basin</u>					
Solomon:					
Glade, Kans.	9**	20	21	14.1	20
Kirwin, Kans.	13	21	21	16.7	21
Red Willow Creek:					
Red Willow, Nebr.	12	11	11	12.6	11

River and station	Flood stage	Above flood stages -dates		Crest*	
		From-	To-	Stage	Date
MISSISSIPPI SYSTEM (Cont'd.) <u>Missouri Basin (Cont'd.)</u>	<i>Ft</i>				<i>Ft</i>
Prairie Dog Creek: Norton, Kans.	17	20	20	19.0	20
Republican: Cambridge, Nebr.	6	12	12	6.0	12-13
<u>Ohio Basin</u>					
Wabash: Montezuma, Ind.	14	7	11	16.9	7
<u>Red Basin</u>					
Little: Whitecliffs, Ark.	25	25	26	25.8	27
WEST GULF OF MEXICO DRAINAGE					
Sabine: Mincola, Tex.	14	23	23	14.2	23

\* Provisional

\*\* USBR data



## Average monthly values

JULY 1953

These average values for standard pressure surfaces were obtained by radio-sonden; dynamic height (geopotential) in units of .98 dynamic meter; tempera-  
ture in degrees centigrade and relative humidity in percent.



# RADIOSONDE DATA

Average monthly values

Table 20—Continued

JULY 1953

HAVANA, CUBA (1011 MB.)				HILO, T. H. (1015 MB.)				INTERNAT. FALLS, MINN. ( 972 MB.)				LAKE CHARLES, LA. (1015 MB.)				LANDER, WYO. ( 830 MB.)				LAS VEGAS, NEV. ( 933 MB.)				LITTLE ROCK, ARK. (1007 MB.)				
Standard pressure surface (mb.)																												
Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				
Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				
Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				
Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				
SURFACE	31	49	25.8	87	31	9	25.1	72	31	360	17.4	79	31	5	26.0	87	31	1,696	24.2	31	31	660	35.5	23	31	79	26.2	72
1,000	31	149	25.9	83	31	142	23.6	73	31	114			31	141	26.4	78	31	26		31	31	25			31	137	26.8	68
950	31	603	23.8	77	31	593	19.5	79	31	557	19.2	64	31	594	23.9	74	31	493		31	31	499			31	592	25.2	63
900	31	1,073	21.1	72	31	1,052	16.0	84	31	1,020	16.0	65	31	1,065	21.1	71	31	1,486		31	31	989	33.9	22	31	1,064	22.1	64
850	31	1,566	18.0	71	31	1,536	13.2	83	31	1,504	12.5	66	31	1,559	18.3	65	31	1,486		31	31	1,501	29.7	24	31	1,559	18.7	65
800	31	2,083	15.1	64	31	2,046	13.3	52	31	2,010	9.6	58	31	2,077	15.6	56	31	2,018	23.9	28	31	2,037	24.9	29	31	2,077	15.6	60
750	31	2,630	12.1	57	31	2,598	12.1	53	31	2,548	6.7	48	31	2,626	12.4	54	31	2,581	19.3	31	31	2,601	19.8	36	31	2,626	12.3	57
700	31	3,202	8.6	56	31	3,164	9.0	28	31	3,107	3.7	40	31	3,198	8.9	52	31	3,165	14.2	36	31	3,186	14.5	43	31	3,198	8.9	56
650	31	3,813	4.8	56	31	3,782	5.6		31	3,709		35	31	3,811	5.7	49	31	3,789	8.9	43	31	3,807	8.8	53	31	3,813	5.8	49
600	31	4,460	1.0	56	31	4,424	2.3		31	4,340	-3.5	34	31	4,461	2.2	46	31	4,441	3.2	50	31	4,463	3.3	59	31	4,460	2.1	52
550	31	5,157	-3.0	57	31	5,120	-2.1		31	5,023	-7.7	31	31	5,161	-2.0	44	31	5,140	-2.5	54	31	5,161	-1.8	60	31	5,161	-1.8	46
500	31	5,905	-7.1	52	31	5,872	-6.8		31	5,757	-12.5	28	31	5,911	-6.3	41	31	5,889	-7.7	50	31	5,915	-6.9	57	31	5,911	-6.1	39
450	31	6,725	-12.0	45	31	6,697	-11.8		31	6,558	-18.2		31	6,739	-11.4		31	6,709	-12.7	40	31	6,740	-11.8	44	31	6,739	-11.0	36
400	31	7,412	-17.9	45	31	7,378	-18.1		31	7,422	-24.4		31	7,422	-17.5		31	7,590	-18.5		31	7,623	-17.5	34	31	7,625	-16.8	35
350	31	8,596	-24.7	41	31	8,560	-26.0		31	8,379	-31.6		31	8,379	-24.5		31	8,572	-25.5		31	8,608	-23.9	39	31	8,614	-23.5	
300	31	9,699	-33.1	39	31	9,655	-34.9		31	9,451	-39.3		31	9,451	-32.8		31	9,672	-33.4		31	9,715	-32.1		31	9,723	-31.7	
250	31	10,953	-43.5		31	10,901	-44.7		31	10,672	-47.1		31	10,968	-42.5		31	10,927	-42.0		31	10,975	-41.7		31	10,987	-41.5	
200	31	12,413	-55.8		31	12,356	-55.9		31	12,130	-51.6		31	12,435	-54.2		31	12,406	-51.5		31	12,451	-53.1		31	12,464	-52.7	
175	31	13,251	-62.0		31	13,195	-61.2		31	12,992	-53.3		31	13,278	-60.4		31	13,262	-56.5		31	13,298	-55.1		31	13,314	-56.6	
150	31	14,194	-67.8		31	14,138	-66.9		31	13,979	-54.7		31	14,222	-66.5		31	14,228	-61.1		31	14,248	-65.1		31	14,271	-63.5	
125	31	15,278	-71.1		31	15,226	-71.6		31	15,140	-55.7		31	15,204	-70.4		31	15,350	-64.1		31	15,369	-69.8		31	15,377	-67.4	
100	31	16,602	-70.0		31	16,535	-72.5		31	16,558	-56.6		31	16,629	-70.3		31	16,721	-62.4		31	16,674	-70.6		31	16,719	-68.0	
75	31	17,934	-67.5		31	17,853	-70.0		31	17,977	-54.7		31	17,962	-67.7		31	18,007	-59.2		31	18,002	-66.4		31	18,065	-65.2	
60	31	19,688	-62.9		31	19,585	-64.8		31	19,822	-53.0		31	19,715	-62.2		31	19,930	-54.2		31	19,765	-60.6		31	19,833	-60.1	
45	31	20,815	-59.5		31	20,707	-61.4		31	20,999	-51.8		31	20,857	-59.2		31	21,099	-52.6		31	21,007	-57.5		31	20,979	-57.1	
30	31	22,218	-57.2		31	22,101	-58.2		31	22,457	-50.6		31	22,251	-56.4		31	22,549	-50.2		31	22,314	-54.5		31	22,401	-54.3	
15	31	24,028	-54.1		31	23,932	-54.7		31	24,338	-48.4		31	24,195	-56.4		31	24,431	-48.0		31	24,268	-51.2		31	24,268	-51.1	
0	31				31				31	27,030	-46.3		31				31				31				31	26,921	-47.4	

MAZATLAN, MEXICO (1009 MB.)				MEDFORD, ORE. ( 968 MB.)				MERIDA, MEXICO (1013 MB.)				MIAMI, FLA. (1017 MB.)				NANTUCKET, MASS. (1014 MB.)				NASHVILLE, TENN. ( 997 MB.)				NORTH PLATTE, NEBR. ( 918 MB.)				
Standard pressure surface (mb.)																												
Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				
Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				
Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				
Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				
SURFACE	28	14	29.2	75	31	401	26.8	33	31	27	26.5	82	31	4	26.6	81	31	14	18.2	91	31	177	24.8	79	31	848	23.8	62
1,000	28	96	28.4	76	31	112			31	141	26.0	80	31	157	26.4	78	31	138	20.1	78	31	149	24.8		31	91		
950	28	558	24.9	77	31	573	25.9	32	31	593	24.2	76	31	600	23.3	78	31	584	19.3	62	31	601	24.6	62	31	551		
900	28	1,026	22.9	74	31	1,039	22.3	35	31	1,066	21.4	74	31	1,079	20.5	75	31	1,045	17.4	56	31	1,054	21.4	62	31	1,024	23.4	57
850	28	1,524	20.2	75	31	1,532	18.2	40	31	1,560	18.5	76	31	1,571	17.7	71	31	1,531	14.8	53	31	1,567	17.8	65	31	1,520	20.1	59
800	28	2,046	17.4	71	31	2,047	14.4	43	31	2,079	15.5	69	31	2,087	14.7	67	31	2,041	11.9	53	31	2,083	14.2	63	31	2,041	17.4	57
750	28	2,598	14.5	68	31	2,595	11.2	42	31	2,623	11.5	52	31	2,631	11.4	63	31	2,585	8.9	48	31	2,630	11.0	56	31	2,594	14.1	53
700	25	3,176	11.1	67	31	3,162	8.1	28	31	3,201	9.2	59	31	3,204	8.1	59	31	3,147	6.0	45	31	3,198	7.5	55	31	3,169	10.5	49
650	25	3,792	6.9	72	31	3,773	4.4		31	3,813	5.6	61	31	3,812	4.5	60	31	3,752	2.9	42	31	3,813	4.2	51	31	3,788	6.1	50
600	25	4,445	2.4	76	31	4,416			31	4,462	1.7	61	31	4,460		60	31	4,394	-1.8	39	31	4,453	-7	45	31	4,432	1.6	49
550	25	5,147	-2.0	73	31	5,112	-3.9		31	5,163	-2.4	58	31	5,156	-3.1	52	31	5,083	-4.8		31	5,152	-3.0	41	31	5,128	-3.3	47
500	23	5,896	-6.1	65	31	5,854	-8.8		31	5,910	-6.2	50	31	5,903	-7.5	48	31	5,827	-9.4		31	5,896	-7.5		31	5,874	8.1	37
450	22	6,717	-13.9	57	31	6,674	-14.7		31	6,737	-11.0	47	31	6,722	-12.4	44	31	6,718	-14.3		31	6,718	-12.9		31	6,693	-13.7	
400	20	7,619	-21.3	53	31	7,576	-22.7		31	7,621	-17.0	48	31	7,607	-18.0	43	31	7,518	-20.1		31	7,598	-18.7	39	31	7,568	-19.5	35
350	20	8,600	-23.2		31	8,512	-28.9		31	8,606	-23.8	42	31	8,590	-24.9	40	31	8,493	-26.8		31	8,579	-25.6	37	31	8,546	-26.3	
300	19	9,709	-31.3		31	9,596	-37.3		31	9,714	-32.2		31	9,691	-33.3	36	31	9,586	-34.6		31	9,679	-33.4		31	9,641	-34.4	
250	16	10,974	-41.2		31	10,831	-45.8		31	10,972	-42.4		31	10,943	-43.7		31	10,832	-44.3		31	10,932	-43.0		31	10,890	-43.8	
200	11	12,448	-53.7		31	12,292	-53.2		31	12,438	-54.3		31	12,402	-55.8		31	12,294	-54.0		31	12,402	-53.4		31	12,353	-53.9	
175	8	13,293	-61.0		31	13,144	-56.9		31	13,278	-61.5		31	13,237	-62.2		31	13,124	-67.9		31	13,249	-58.9		31	13,198	-59.3	
150	5	14,237	-68.2		31	14,112	-60.2		31	14,216	-67.9		31	14,174	-67.7		31	14,103	-61.2		31	14,206	-64.0		31	14,151	-63.1	
125					31	15,245	-61.4		31	15,298	-72.7		31	15,260	-70.8		31	15,229	-62.2		31	15,313	-66.9		31	15,259	-66.8	
100					31	16,627	-61.6		31	16,606	-72.7		31	16,585	-70.2													

These average values for standard pressure surfaces were obtained by radio-sondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.



# RADIOSONDE DATA

Average monthly values

Table 20—Continued

JULY 1953

ST. CLOUD, MINN. ( 978 MB. )					SAN ANTONIO, TEX. ( 986 MB. )					SAN JUAN, P. R. (1016 MB. )					SANTA MARIA, CALIF. (1005 MB. )					S. STE. MARTE, MICH. ( 990 MB. )					SPOKANE, WASH. ( 932 MB. )					SWAN ISLAND, W. I. (1013 MB. )				
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity						
SURFACE	31	316	20.3	75	31	243	29.6	57	31	19	26.5	83	31	71	15.1	77	31	221	15.7	87	31	722	25.4	25	31	10	27.1	84						
1,000	31	123			31	119			31	159	25.8	81	31	115	14.6	77	31	134			31	92			31	128	26.8	81						
950	31	573	21.0	64	31	582	27.5	61	31	610	22.8	82	31	569	21.9	47	31	579	17.7	64	31	551			31	583	23.4	82						
900	31	1,036	18.1	64	31	1,055	24.0	66	31	1,080	19.9	81	31	1,025	25.7	19	31	1,035	15.2	65	31	1,023	23.0	24	31	1,051	20.7	78						
850	31	1,523	14.8	64	31	1,553	20.5	70	31	1,572	17.1	76	31	1,525	23.5	20	31	1,517	11.9	69	31	1,516	18.4	29	31	1,544	18.0	73						
800	31	2,034	12.0	56	31	2,074	16.9	73	31	2,089	15.2	63	31	2,050	19.8	25	31	2,022	9.1	65	31	2,031	13.6	34	31	2,062	15.5	61						
750	31	2,579	9.4	47	31	2,620	13.9	62	31	2,635	12.3	53	31	2,604	15.6	29	31	2,561	6.5	56	31	2,574	8.8	38	31	2,612	12.8	52						
700	31	3,142	6.0	44	31	3,202	10.8	54	31	3,209	8.8	47	31	3,182	11.5	31	31	3,118	3.7	46	31	3,136	4.7	35	31	3,183	9.4	49						
650	31	3,751	2.3	40	31	3,815	7.2	48	31	3,823	4.9	44	31	3,800	7.7	31	31	3,724	.3	43	31	3,742	1.1	27	31	3,797	5.5	53						
600	31	4,387	-1.5	37	31	4,471	3.3	42	31	4,467	.7	45	31	4,452	3.2	31	31	4,354	-3.5	38	31	4,375	-2.7	26	31	4,444	1.6	49						
550	31	5,077	-6.0	32	31	5,174	-1.0	41	31	5,165	-2.9	40	31	5,152	-1.4		31	5,041	-7.7	39	31	5,060	-7.2	27	31	5,142	-2.4	47						
500	31	5,814	-10.8		31	5,926	-5.6	40	31	5,910	-7.2	35	31	5,904	-6.4		31	5,772	-12.5	39	31	5,795	-12.1		31	5,890	-7.0	50						
450	31	6,626	-16.4		31	6,757	-10.6	32	31	6,738	-12.4	34	31	6,728	-11.9		31	6,575	-17.8	34	31	6,598	-18.1		31	6,714	-12.0	45						
400	31	7,492	-22.5		31	7,641	-16.8	26	31	7,614	-18.3	31	31	7,610	-18.5		31	7,442	-23.8		31	7,464	-23.9		31	7,597	-17.6	42						
350	31	8,458	-29.7		29	8,630	-23.6		30	8,595	-25.8		31	8,591	-25.5		31	8,403	-31.1		29	8,424	-30.7		31	8,582	-24.6	38						
300	31	9,538	-37.8		29	9,737	-32.2		30	9,691	-34.6	33	31	9,691	-33.3		30	9,478	-38.8		29	9,499	-38.5		31	9,684	-33.0							
250	31	10,772	-46.2		28	10,996	-42.1		30	10,938	-44.7		31	10,946	-42.6		30	10,708	-47.0		29	10,727	-46.9		31	10,938	-43.3							
200	31	12,231	-53.1		27	12,466	-53.6		30	12,392	-56.7		31	12,415	-53.1		30	12,163	-52.5		30	12,179	-53.4		31	12,399	-55.4							
175	30	13,087	-55.7		27	13,312	-59.5		30	13,225	-63.0		31	13,261	-59.5		28	13,028	-54.6		29	13,036	-54.4		31	13,237	-62.0							
150	28	14,062	-58.4		27	14,262	-65.7		30	14,162	-67.5		31	14,210	-65.7		24	14,004	-55.6		29	14,019	-55.6		30	14,173	-68.8							
125	27	15,198	-59.9		27	15,355	-70.7		31	15,249	-70.7		31	15,302	-70.4		20	15,149	-56.0		29	15,177	-56.8		25	15,251	-73.0							
100	26	16,590	-59.0		25	16,672	-71.3		27	16,570	-71.7		29	16,627	-68.7		15	16,563	-55.9		29	16,589	-57.1		21	16,559	-72.2							
75	26	17,994	-57.5		23	17,997	-68.3		25	17,894	-69.1		29	17,974	-65.0		11	17,955	-55.2		29	18,001	-56.2		14	17,870	-70.9							
60	26	19,823	-54.4		20	19,745	-62.2		20	19,639	-63.2		28	19,751	-59.1		25	20,896	-56.4		28	19,835	-54.0		12	19,599	-64.3							
50	23	20,988	-52.2		20	20,881	-58.5		19	20,765	-60.6		25	20,896	-56.4		20	22,321	-53.6		28	21,009	-52.6		11	20,723	-61.1							
40	19	22,443	-50.7		14	22,294	-54.8		13	22,168	-57.0		20	22,321	-53.6		22	22,451	-51.2		22	22,451	-51.2		9	22,326	-49.4							
30					6	24,133	-52.5						13	24,184	-50.6						6	26,997	-46.7			6	23,954	-54.1						
20																																		

TACUBAYA, MEXICO ( 775 MB. )					TAMPA, FLA. (1017 MB. )					TATOOSH ISLAND, WASH. (1016 MB. )					VERACRUZ, MEXICO (1011 MB. )					WASHINGTON, D. C. (1007 MB. )				
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	2,306	17.2	69	31	7	25.8	83	31	31	13.2	88	31	13	28.6	77	31	88	22.9	74	31	88	22.9	74
1,000	31	63			31	156	26.2	77	31	166	12.8	88	31	108	27.8	77	31	149	24.9	64	31	149	24.9	64
950	31	528			31	612	23.5	75	31	600	12.4	75	31	561	24.6	78	31	601	23.7	58	31	601	23.7	58
900	31	1,008			31	1,079	20.6	75	31	1,050	11.2	66	31	1,035	21.7	74	31	1,070	20.4	60	31	1,070	20.4	60
850	31	1,501			31	1,572	17.5	75	31	1,525	9.1	63	31	1,530	18.6	69	31	1,561	17.0	61	31	1,561	17.0	61
800	31	2,035			31	2,088	14.4	72	31	2,026	6.8	55	31	2,048	15.3	65	31	2,075	13.4	64	31	2,075	13.4	64
750	31	2,585	15.3	66	31	2,643	11.7	63	31	2,561	4.5	46	31	2,598	12.1	61	31	2,621	9.9	61	31	2,621	9.9	61
700	31	3,163	10.8	71	31	3,206	8.7	58	31	3,113	1.5	40	31	3,168	8.7	59	31	3,185	6.8	51	31	3,185	6.8	51
650	31	3,784	6.3	78	31	3,823	5.1	59	31	3,709	-1.9	40	30	3,782	5.1	64	31	3,796	3.4	43	31	3,796	3.4	43
600	31	4,430	1.8	83	31	4,465	1.3	55	31	4,339	-5.8	38	27	4,428	1.5	58	31	4,436	-2.2	40	31	4,436	-2.2	40
550	31	5,135	-2.4	82	31	5,168	-2.6	51	31	5,017	-10.1	37	26	5,124	-2.4	57	31	5,130	-4.1	37	31	5,130	-4.1	37
500	31	5,881	-6.4	76	31	5,911	-7.0	52	31	5,743	-14.9	35	26	5,876	-6.7	48	30	5,874	-8.4	38	31	5,874	-8.4	38
450	30	6,707	-10.8	62	31	6,743	-11.9	45	31	6,539	-20.3	33	25	6,701	-11.3	40	30	6,694	-13.3	37	31	6,694	-13.3	37
400	29	7,595	-16.5	55	31	7,618	-17.4	48	31	7,394	-26.5		25	7,589	-16.8	36	30	7,571	-19.1	39	31	7,571	-19.1	39
350	29	8,585	-23.4	51	31	8,605	-24.2	48	31	8,344	-33.7		24	8,577	-23.7		30	8,550	-25.9	39	31	8,550	-25.9	39
300	28	9,693	-31.9	54	31	9,709	-32.4	46	31	9,407	-41.2		23	9,686	-32.1		30	9,648	-33.7	39	31	9,648	-33.7	39
250	26	10,957	-42.0		31	10,967	-42.7		30	10,631	-49.1		21	10,946	-42.3		30	10,901	-42.8		31	10,901	-42.8	
200	21	12,424	-54.6		31	12,433	-54.9		30	12,077	-53.1		20	12,417	-54.6		30	12,371	-53.0		31	12,371	-53.0	
175	16	13,258	-61.2		31	13,273	-61.3		30	12,937	-52.7		17	13,259	-61.2		30	13,221	-58.2		31	13,221	-58.2	
150	14	14,197	-67.8		31	14,214	-67.2		30	13,930	-53.7		17	14,200	-68.3		30	14,179	-62.8		31	14,179	-62.8	
125	12	15,276	-72.9		27	15,302	-71.1		29	15,102	-53.8		14	15,271										

## Average monthly resultant winds

JULY 1953

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.



# RAWIN DATA

Average monthly resultant winds

Table 22

JULY 1953

Altitude (meters) m.s.l	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrowood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			Int. Falls, Minn. (358 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed				
Surface	31	143	2.8	31	138	4.6	31	118	1.8	31	129	5.8	31	168	1.0	31	230	1.4	31	198	1.2	31	122	1.3	31	68	1.3	31	201	0.7	31	214	1.2	31	207	0.9
500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,000	---	---	---	31	147	7.2	31	171	1.8	31	151	9.0	31	148	1.5	31	258	4.8	31	210	2.6	31	148	2.4	---	---	---	31	201	2.2	30	243	2.6	31	232	1.6
1,500	---	---	---	31	158	8.1	31	239	2.5	31	150	6.9	31	75	1.1	30	279	7.1	31	109	.6	31	197	2.7	31	76	1.1	31	243	1.0	31	330	1.2	31	269	5.5
2,000	31	189	3.1	31	163	7.5	31	272	4.0	31	148	5.0	30	54	1.1	30	276	7.3	31	111	.8	31	233	2.4	31	189	.7	30	261	.7	31	317	1.3	31	291	6.6
2,500	31	193	2.9	31	167	5.8	31	277	6.0	31	139	3.7	30	39	.9	30	279	8.0	30	135	.5	31	258	2.8	31	242	1.3	30	284	1.0	31	302	1.7	31	295	7.5
3,000	31	193	2.3	31	170	3.1	31	286	7.6	31	144	2.9	30	352	.7	30	274	7.9	30	127	.6	31	274	2.8	31	250	2.2	30	310	1.7	31	291	2.1	30	296	8.4
4,000	31	168	1.4	31	30	1.4	30	292	10.5	31	114	2.6	30	295	.8	30	269	9.7	30	241	.4	31	319	3.7	31	267	1.8	30	293	3.0	31	297	3.0	30	293	11.7
5,000	30	14	1.4	31	10	3.2	30	296	13.3	31	109	3.2	31	289	1.5	30	275	11.4	30	317	1.5	31	322	4.8	31	273	1.6	29	288	4.5	30	275	3.5	29	280	13.9
6,000	30	329	.8	31	16	2.7	27	303	15.9	31	99	3.5	31	306	1.4	27	265	12.0	30	301	2.7	29	307	6.4	31	266	3.2	26	281	6.4	30	277	4.4	28	286	16.8
8,000	30	284	2.2	30	15	2.5	25	290	19.1	30	87	3.0	30	279	1.1	22	252	13.4	29	252	3.4	28	292	11.2	31	255	8.7	23	281	8.0	27	275	5.6	22	281	17.1
10,000	30	287	3.8	29	7	3.4	18	279	19.9	29	101	2.8	29	2	1.0	18	247	20.7	29	277	6.1	23	301	15.1	31	262	11.8	21	279	10.7	27	283	8.4	15	291	13.6
12,000	27	301	3.1	27	33	2.6	12	284	21.3	30	108	2.1	29	39	3.9	13	257	22.4	28	281	7.0	18	305	13.2	29	264	16.5	19	296	11.2	27	292	8.6			
14,000	26	310	3.1	25	19	3.4				27	102	6.2	29	51	4.7	11	278	10.8	26	295	4.0	15	322	8.2	26	263	13.4	15	296	8.9	25	321	8.0			
16,000	26	30	.9	19	63	6.7				18	102	9.4	27	65	6.6	10	272	6.1	20	73	4.2	11	329	5.6	20	276	7.6	10	341	4.0	22	38	4.3			
18,000	16	82	5.2	17	82	7.8				15	94	11.4	22	79	9.7				17	88	7.6				17	96	1.8			20	66	6.0				
20,000	12	87	10.1	15	83	12.5				12	104	13.2	17	76	12.4				12	91	7.1				12	91	7.1			20	77	9.9				
22,000	11	86	14.8							11	101	19.6							14	85	10.4				10	90	9.9			16	89	14.2				
24,000										10	106	16.5																								

Altitude (meters) m.s.l	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P.R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)			
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		
Surface	31	156	0.8	31	323	3.5	31	104	1.7	31	238	1.5	31	171	0.5	31	292	3.8	30	121	3.7	31	92	2.2	31	112	5.8	31	104	3.5	31	108	0.7	31	268	3.0	
500	31	162	2.6	31	322	4.5	31	134	3.3	31	266	4.7	30	155	1.2	31	283	4.8	30	132	4.7	---	---	---	31	135	8.8	31	93	8.7	30	311	.2	31	335	3.9	
1,000	31	172	2.3	31	318	5.1	31	131	3.4	31	281	4.3	30	127	.5	31	288	4.8	30	162	6.6	31	94	2.5	31	146	9.0	31	100	9.2	30	259	2.9	31	338	4.5	
1,500	31	164	2.2	31	312	2.8	31	126	2.5	31	277	5.0	30	160	1.0	31	284	3.5	30	178	5.2	31	136	5.6	31	145	5.7	31	99	8.9	30	275	5.2	31	14	3.5	
2,000	31	135	1.5	31	277	2.0	30	128	1.6	31	277	5.9	31	221	1.2	31	268	3.1	30	203	3.5	31	164	4.1	31	155	3.0	31	95	8.8	30	283	6.2	31	49	3.3	
2,500	31	109	1.1	31	234	4.1	30	124	1.1	31	273	6.4	31	258	.6	31	251	3.3	30	250	2.0	31	222	3.5	31	151	1.2	31	94	9.2	30	291	6.7	31	75	1.8	
3,000	31	95	.8	31	225	6.2	30	124	1.4	31	265	7.0	31	347	.4	31	236	3.7	30	300	1.8	31	269	5.1	31	111	1.0	31	93	9.3	30	290	7.3	31	196	.5	
4,000	31	5	2.0	31	234	7.4	31	105	.6	31	258	9.4	31	309	2.3	31	228	4.3	30	329	3.6	31	294	8.7	31	48	2.2	31	94	8.0	31	293	9.9	31	213	2.0	
5,000	31	334	2.4	31	235	10.1	31	90	1.4	30	260	10.9	31	300	3.3	31	228	5.7	30	342	5.2	31	291	12.3	31	49	2.9	31	96	5.8	31	296	12.7	31	206	2.1	
6,000	31	326	3.1	31	235	12.6	31	77	2.3	27	259	10.8	31	299	4.6	31	234	7.2	30	337	6.1	31	292	14.5	31	47	2.5	31	98	4.1	28	300	13.0	31	220	2.3	
8,000	29	308	5.4	29	242	16.5	31	64	4.3	25	265	15.3	30	300	8.3	31	240	10.5	30	315	6.4	29	288	18.3	29	18	1.4	31	128	2.4	25	301	16.4	31	231	4.9	
10,000	27	292	8.1	25	240	17.3	31	47	7.1	19	264	19.5	29	290	9.2	29	234	16.0	28	318	6.5	24	284	18.3	28	22	2.4	29	193	3.1	20	298	17.7	31	224	8.8	
12,000	24	277	10.4	18	232	24.6	29	50	10.2			28	285	12.8	17	232	19.9	26	316	8.3	18	273	20.7	28	19	2.3	29	240	3.7	13	316	18.0	30	223	11.5		
14,000	22	291	7.3	11	240	23.2						25	286	11.1				26	319	7.6	14	279	15.6	27	55	3.0	29	239	3.0				29	215	8.8		
16,000	20	328	5.7				20	69	8.6			24	327	5.4				26	352	4.9	13	276	11.1	25	72	6.9	28	108	4.4				28	176	7.5		
18,000	16	49	3.2				15	85	10.7			20	56	2.6				22	63	4.8				22	84	10.3	22	95	8.5				28	100	5.2		
20,000	11	90	9.8									19	77	9.2				15	80	8.9				20	89	13.1	18	76	14.9				26	89	10.4		
22,000												14	80	12.6										20	88	18.2							20	90	14.8		
24,000												11	85	15.2																					12	93	13.4

Altitude (meters) m.s.l	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is. Wash. (33 m.)			Washington, D.C. (88 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed	
Surface	30	269	1.1	31	225	1.8	31	226	3.1	31	156	0.9
500	29	275	3.2	---	---	---	31	262	4.1	31	217	1.4

# SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun.

JULY 1953

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
TABLE MOUNTAIN, CALIF.									
	Air mass								
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
July									
1	---	---	---	1.46	---	---	---	---	---
11	---	---	---	1.37	---	---	---	---	---
16	---	---	---	1.46	---	---	---	---	---
18	---	---	---	1.34	---	---	---	---	---
20	---	---	---	1.29	---	---	---	---	---
21	---	---	---	1.30	---	---	---	---	---
27	---	---	---	1.28	---	---	---	---	---
28	---	---	---	1.35	---	---	---	---	---
Averages	---	---	---	1.36	---	---	---	---	---
Departures	---	---	---	-.05	---	---	---	---	---
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
July									
3	---	---	---	---	---	1.22	1.09	0.96	0.85
4	0.87	0.96	1.07	1.25	---	---	1.06	.96	.86
5	.90	.98	1.09	---	---	---	---	---	---
7	---	---	---	---	---	1.22	1.09	.98	.87
9	---	---	---	---	---	1.22	1.04	.90	.79
10	.80	.91	1.02	1.21	---	---	---	---	---
18	.56	.66	.80	.96	---	1.05	.95	.80	.73
19	---	---	---	1.13	---	---	---	---	---
25	.83	.93	1.06	1.22	---	1.26	1.09	.96	.87
Averages	.79	.89	1.01	1.15	---	1.19	1.06	.93	.83
Departures	+.13	+.15	+.13	+.11	---	+.16	+.20	+.20	+.18
MADISON, WIS.									
	Air mass								
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
NO DATA DURING JULY 1953									
* Extrapolated									

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of

Sun's zenith distance									
Date	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
ALBUQUERQUE, N. MEX.									
Air mass									
	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08
July									
1	0.65	0.74	0.91	1.09	---	---	---	---	---
2	.66	.78	.93	1.13	---	---	---	---	---
4	.77	---	---	1.16	---	---	---	---	---
5	.77	.81	.92	1.12	---	---	---	---	---
8	.81	.91	1.06	1.21	---	---	---	---	---
9	.99	1.04	1.14	1.22	---	---	---	---	---
11	.74	.81	---	1.11	---	---	---	---	---
13	---	.85	1.06	1.19	---	1.17	1.02	0.89	0.80
14	.80	.89	1.02	1.18	---	---	---	---	---
16	.87	.95	1.08	1.23	---	---	---	---	---
19	.77	.88	1.03	1.18	---	1.21	---	---	---
20	---	---	1.04	---	---	1.23	---	---	.82
21	.81	.91	1.04	1.19	---	1.19	1.00	.87	.80
22	.77	.89	---	---	---	---	---	---	---
23	.86	.96	1.07	1.23	---	1.14	.90	.78	---
24	.75	.86	1.01	1.19	---	1.16	.99	.89	.77
25	.64	.76	.91	1.14	---	1.12	.92	.78	.68
26	.73	.84	1.01	---	---	1.11	.91	.67	---
27	.68	.82	.95	1.16	---	---	---	.80	.69
28	.65	.80	.97	1.19	---	1.17	1.04	---	.76
29	.72	.96	1.16	1.27	---	---	---	---	---
Averages	.76	.87	1.02	1.18	----	1.17	.97	.81	.76
Departures	+.03	+.05	+.07	+.06	----	-.05	-.02	-.04	-.05
LINCOLN, NEBR.									
Air mass									
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
July									
7	---	---	---	---	---	1.01	0.79	0.67	0.56
22	---	---	---	---	---	1.10	.92	.77	.67
23	---	---	---	---	---	1.01	.88	.77	.64
24	---	---	---	---	---	1.03	.86	.71	.60
25	---	---	---	---	---	.94	.77	.64	.54
31	---	---	---	---	---	.92	.75	.58	.47
Averages	---	---	---	---	---	1.00	.83	.69	.58
Departures	---	---	---	---	---	-.06	-.05	-.06	-.08
BOSTON, MASS.									
Air mass									
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
RECORDER INOPERATIVE									

pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.



# SOLAR RADIATION DATA

JULY 1953

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

	2	3	4	5	6	7	8	Avg	9	10	11	12	13	14	15	Avg	16	17	18	19	20	21	22	Avg
Date	140	126	169	192	133	146	169	154	151	186	137	158	63	89	129	130	160	146	145	140	137	172	22	137
Langleys	132	151	129	125	163	131	130	130	134	138	166	117	154	178	81	138								

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

	2	3	4	5	6	7	8	Avg	9	10	11	12	13	14	15	Avg	16	17	18	19	20	21	22	Avg
Date	146	202	403	375	315	305	338	298	303	432	243	285	62	109	127	223	363	358	369	387	184	135	46	263
Langleys	23	24	25	26	27	28	29	220	30	31	1	2	3	4	5	242								

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

	2	3	4	5	6	7	8	Avg	9	10	11	12	13	14	15	Avg	16	17	18	19	20	21	22	Avg
Date	206	239	257	236	243	246	172	228	270	196	214	198	47	61	159	164	198	240	231	234	218	194	22	219
Langleys	23	24	25	26	27	28	29	189	30	31	1	2	3	4	5	215								

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

	2	3	4	5	6	7	8	Avg	9	10	11	12	13	14	15	Avg	16	17	18	19	20	21	22	Avg
Date	271	433	416	416	182	428	171	331	414	376	247	178	115	206	385	274	258	370	392	342	295	373	45	296
Langleys	23	24	25	26	27	28	29	274	30	31	1	2	3	4	5	269								

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

	2	3	4	5	6	7	8	Avg	9	10	11	12	13	14	15	Avg	16	17	18	19	20	21	22	Avg
Date	243	107	89	169	207	91	216	160	110	150	206	263	92	148	159	161	201	123	102	96	250	188	45	144
Langleys	23	24	25	26	27	28	29	116	154	82	95	116	86	291	122	135								

Note: Langley is the unit used to denote one gram calorie per square centimeter.

# SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleyes.

JULY 1953

	Albuquerque, N.Mex.	Astoria, Ore.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Big Spring, Texas	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Texas	Canton Island	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Columbus, Ohio	Davis, Calif.	Dodge City, Kans.	East Lansing, Mich.	East Wareham, Mass.	Edmonton, Alberta	El Paso, Texas	ELY, Nev.	Fairbanks, Alaska	Fort Worth, Texas	Fresno, Calif.	Glasgow, Mont.	Grand Junction, Colo.	Grand Lake, Colo.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.		
July 2-----	518	748	370	645	762	682	803	417	768	504	730	---	564	732	610	589	709	461	217	494	542	780	851	616	822	828	---	842	642	655	686	756	565	863	568	716		
July 3-----	597	729	568	601	659	753	703	733	703	703	730	---	543	542	598	523	761	712	733	637	503	351	805	861	347	784	825	---	837	835	500	495	750	845	792	602		
July 4-----	510	764	698	603	767	666	843	781	753	768	772	642	481	579	527	745	745	745	589	555	555	603	824	824	460	836	808	---	837	835	500	495	750	845	792	602		
July 5-----	588	778	692	603	767	666	843	781	753	768	772	642	481	579	527	745	745	745	589	555	555	603	824	824	460	836	808	---	837	835	500	495	750	845	792	602		
July 6-----	588	778	692	603	767	666	843	781	753	768	772	642	481	579	527	745	745	745	589	555	555	603	824	824	460	836	808	---	837	835	500	495	750	845	792	602		
July 7-----	588	778	692	603	767	666	843	781	753	768	772	642	481	579	527	745	745	745	589	555	555	603	824	824	460	836	808	---	837	835	500	495	750	845	792	602		
July 8-----	588	778	692	603	767	666	843	781	753	768	772	642	481	579	527	745	745	745	589	555	555	603	824	824	460	836	808	---	837	835	500	495	750	845	792	602		
Averages-----	395	731	627	582	762	682	803	417	768	504	730	---	564	732	610	589	709	461	217	494	542	780	851	616	822	828	---	842	642	655	686	756	565	863	568	716		
Departures-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
July 9-----	764	788	557	584	558	437	557	733	737	739	508	(662)	---	441	794	586	725	783	476	557	681	746	282	411	700	585	803	---	842	642	655	686	756	565	863	568	716	
July 10-----	638	802	681	661	480	620	557	747	651	643	541	530	410	---	209	721	768	703	612	580	631	769	465	---	522	(833)	803	---	842	642	655	686	756	565	863	568	716	
July 11-----	605	620	623	706	305	724	647	754	578	721	685	766	(583)	---	636	676	745	698	98	453	566	675	(771)	792	(743)	733	(781)	---	842	642	655	686	756	565	863	568	716	
July 12-----	349	491	329	612	---	317	519	747	452	617	366	688	708	---	(572)	611	582	646	465	337	353	558	566	537	(588)	308	746	---	842	642	655	686	756	565	863	568	716	
July 13-----	354	787	277	461	---	405	635	730	160	718	222	648	---	---	629	558	636	668	708	531	176	160	609	451	(525)	242	694	---	842	642	655	686	756	565	863	568	716	
July 14-----	458	787	277	461	---	405	635	730	160	718	222	648	---	---	629	558	636	668	708	531	176	160	609	451	(525)	242	694	---	842	642	655	686	756	565	863	568	716	
July 15-----	308	608	517	316	---	595	466	770	491	758	438	452	701	---	578	539	575	675	683	671	188	268	767	556	222	681	(763)	800	---	842	642	655	686	756	565	863	568	716
Averages-----	502	690	520	565	---	549	572	761	468	702	445	579	(520)	---	(555)	697	643	685	496	395	514	(712)	514	(512)	507	(741)	744	---	842	642	655	686	756	565	863	568	716	
Departures-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
July 16-----	345	659	789	394	---	698	522	289	614	812	541	658	290	---	738	462	569	652	465	501	558	577	734	761	430	270	769	806	---	842	642	655	686	756	565	863	568	716
July 17-----	214	493	754	417	---	245	442	778	720	774	590	706	657	---	554	642	382	636	553	252	531	643	728	409	424	516	737	813	---	842	642	655	686	756	565	863	568	716
July 18-----	299	652	453	368	---	352	306	760	735	795	586	736	691	---	616	703	148	641	399	348	607	684	539	340	346	748	832	---	842	642	655	686	756	565	863	568	716	
July 19-----	685	769	483	428	---	221	486	693	726	763	589	744	(670)	446	416	721	657	672	481	480	679	304	742	681	413	252	(755)	819	---	842	642	655	686	756	565	863	568	716
July 20-----	355	673	563	551	---	106	483	698	530	768	437	702	(608)	169	598	575	686	661	568	442	440	560	684	442	362	738	(775)	736	---	842	642	655	686	756	565	863	568	716
July 21-----	483	723	766	372	---	250	---	(757)	483	724	468	780	646	---	731	466	566	689	594	333	653	721	498	450	686	---	800	754	---	842	642	655	686	756	565	863	568	716
July 22-----	468	528	500	308	---	357	541	(781)	718	39	787	672	768	---	769	280	769	236	689	489	489	489	489	489	489	489	489	---	842	642	655	686	756	565	863	568	716	
Averages-----	408	643	616	405	---	316	463	(681)	555	779	469	729	(584)	596	558	611	464	663	557	407	479	529	715	598	422	432	(757)	805	---	842	642	655	686	756	565	863	568	716
Departures-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
July 23-----	653	763	733	536	---	589	558	524	---	711	89	723	(553)	255	431	665	768	687	449	578	120	453	727	666	662	772	754	---	842	642	655	686	756	565	863	568	716	
July 24-----	492	772	443	733	---	707	511	665	640	723	646	640	(621)	326	657	744	797	724	782	627	259	751	767	675	616	796	773	---	842	642	655	686	756	565	863	568	716	
July 25-----	404	763	557	672	---	679	619	661	754	515	761	685	595	709	555	751	754	679	778	459	667	523	(716)	777	(650)	667	796	---	842	642	655	686	756	565	863	568	716	
July 26-----	323	727	588	710	---	646	461	(677)	659	720	684	751	559	147	237	728	734	697	768	509	685	338	688	690	651	609	778	682	---	842	642	655	686	756	565	863	568	716
July 27-----	562	708	740	378	---	675	596	686	287	705	---	651	(513)	582	230	586	513	684	773	489	393	589	644	619	(601)	763	747	592	---	842	642	655	686	756	565	863	568	716
July 28-----	497	764	665	442	---	402	517	415	616	547	367	671	309	762	444	644	682	706	756	489	637	480	(653)	634	(598)	654	753	---	842	642	655	686	756	565	863	568	716	
July 29-----	395	573	647	701	---	310	557	624	228	695	145	711	642	261	662	561	649	675	758	202	549	471	551	(540)	(748)	791	---	842	642	655	686	756	565	863	568	716		
Averages-----	504	724	625	596	---	573	546	(607)	531	659	449	691	(542)	435	457	568	700	693	723	479	502	459	(664)	644	(625)	690	(767)	712	---	842	642	655	686	756	565	863	568	716
Departures-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
July 30-----	608	691	759	708	---	290	555	679	618	633	422	752	674	749	639	495	505	673	752	455	544	503	554	491	(565)	(534)	---	842	642	655	686	756	565	863	568	716		
July 31-----	546	504	763	627	---	303	543	551	724	648	551	756	611	640	670	605	670	605	381	663	200	549	550	550	550	550	---	842	642	655	686	756	565	863	568	716		
Aug. 1-----	517	502	743	737	---	194	429	355	720	679	577	719	608	504	668	522	677	520	455	677	(134)	686	457	307	743	(746)	---	842	642	655	686	756	565	863	568	716		
Aug. 2-----	172	669	195	631	---	262	487	360	206	524	131	625	744	448	657	648	539	368	358	92	174	600	755	662	393	738	783	---	842	642	655	686	756	565	863	568	716	
Aug. 3-----	198	767	283	496	---	191	554	250	702	492	528	668	679	545	570	504	368																					



## JULY 1953

JULY 1953

	Lander, Wyo.	Las Vegas Nev.	Lincoln, Nebr.	Little Rock Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCO)	Madison Wis.	Medford Ore.	Miami, Fla.	Newport, R. I.	New York N. Y.	Oak Ridge Tenn.	Ottawa Ontario	Phoenix Ariz.	Portland Me.	Prosser, Wash.	Put-In-Bay Ohio	Rapid City, S. Dak.	Riverside Calif.	Salt Lake City, Utah	San Antonio Texas	Santa Maria, Calif.	S. Ste. Marie Mich.	Saville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (U. of W.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Island, B. M. I.	Tampa, Fla.	Upton, N. Y.	Washington, D. C. (Amer. U.)	Winnipeg, Manitoba	Toronto, Ontario	
1953																																					
July 1	818	609	679	745	633	745	633	---	629	602	581	413	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 2	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 3	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 4	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 5	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 6	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 7	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 8	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 9	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 10	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 11	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 12	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 13	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 14	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
July 15	818	585	625	633	745	633	745	---	629	557	781	293	311	717	384	797	238	691	748	734	698	594	695	510	581	716	787	365	671	662	648	---	595	815	331		
Averages	604	332	354	459	645	603	803	403	573	410	592	387	573	658	554	737	609	563	630	571	664	721	700	586	475	625	585	607	444	608	677	578	591	640	547		
Departures	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
July 16	262	618	435	721	570	606	797	659	568	663	390	687	659	705	772	529	234	701	515	702	699	703	539	523	631	---	758	647	388	584	398	618	592	487	655		
July 17	783	359	355	722	593	251	---	716	622	719	273	720	482	740	760	315	724	649	733	581	650	612	720	557	653	537	726	663	537	726	663	537	726	663	537	726	
July 18	663	339	518	701	677	634	82	610	616	630	142	325	710	735	770	513	345	654	717	214	732	517	214	732	335	613	222	380	309	246	225	592	625	440	716	441	
July 19	731	746	668	694	693	614	495	772	691	585	745	676	724	699	810	674	638	749	758	674	638	749	758	674	638	749	758	674	638	749	758	674	638	749	758	674	
July 20	748	754	285	711	765	673	305	810	855	303	597	468	722	597	761	909	511	674	638	749	758	674	638	749	758	674	638	749	758	674	638	749	758	674	638	749	
July 21	818	728	551	417	723	655	381	787	384	508	348	498	628	720	580	756	548	658	688	727	601	692	754	577	535	580	733	700	689	748	395	595	423	668	747	369	617
July 22	818	753	713	627	698	635	718	787	450	118	520	98	679	724	390	736	55	695	662	703	620	646	742	339	478	475	255	430	444	692	311	641	349	433	400	386	
Averages	671	608	552	461	719	648	503	798	660	467	359	597	679	650	757	395	566	673	682	694	678	630	580	488	568	450	585	558	559	485	609	547	558	588	496		
Departures	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
July 23	746	783	956	620	731	650	706	784	387	639	708	826	---	719	593	765	682	680	673	664	689	630	601	115	409	613	526	465	405	581	314	56	370	719	586		
July 24	655	607	680	631	681	646	732	441	630	748	826	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
July 25	731	746	668	694	693	614	495	772	691	585	745	676	724	699	810	674	638	749	758	674	638	749	758	674	638	749	758	674	638	749	758	674	638	749	758	674	
July 26	590	740	720	691	647	128	781	692	727	657	698	614	211	713	667	711	573	520	671	368	744	746	458	712	513	735	305	408	464	734	535	591	707	685	660	578	
July 27	505	739	556	715	670	674	613	774	393	344	490	618	717	686	492	731	589	623	655	508	716	800	486	369	599	550	562	486	712	658	550	513	650	659	587	518	
July 28	646	656	633	715	655	611	333	761	393	593	701	638	752	558	737	589	288	662	431	634	693	378	631	498	617	527	548	638	717	598	537	652	656	701	664	374	
July 29	627	793	536	526	667	638	333	747	385	395	477	623	---	---	---	---	152	601	665	598	696	692	749	555	169	543	223	193	218	---	665	601	551	537	638	374	
Averages	643	753	621	665	686	631	465	770	476	468	507	614	613	679	626	747	534	531	668	659	655	697	568	404	627	488	480	583	639	619	487	566	590	633	551		
Departures	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
July 30	570	632	628	708	579	408	255	---	621	707	438	783	275	646	739	492	329	353	577	732	678	696	714	559	451	376	410	682	598	628	446	512	592	671	618		
Aug. 1	450	540	320	566	597	429	403	652	658	487	597	484	682	736	718	677	161	288	479	461	572	574	779	58	305	263	684	706	686	649	689	430	281	263	410		
Aug. 2	179	97	479	647	579	459	203	581	831	81	48	580	732	736	718	677	161	288	479	461	572	574	779	58	305	263	684	706	686	649	689	430	281	263	410		
Aug. 3	629	807	623	623	591	482	584	593	642	692	501	773	736	692	501	413	232	676	660	687	683	431	671	600	639	332	370	341	467	358	655	710	396	485	665		
Aug. 4	794	819	617	622	596	592	247	584	483	597	348	486	144	738	555	558	---	520	729	711	739	654	116	576	191	252	575	435	570	360	683	622	465	73	485		
Aug. 5	587	817	375	628	801	672	247	690	330	154	455	525	656	726	292	666	393	664	725	711	710	641	410	537	184	355	555	276	---	595	522	393	435	627	485		
Averages	537	585	518	638	664	627	316	626	536	448	479	50																									

Accumulated Departures January 1 to August 5, 1953

Note.--Langley is the unit used to denote one gram calorie per square  
Values in parentheses are interpolated.

## ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

JULY 1953

Station	Day of month																																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average		
Baltimore, Md. -----	725	755	828	760	630	--	824	500	815	675	--	(682)	768	812	791	755	800	751	661	610	660	703	583	536	--	--	--	771	795	633	576	706	---	
Philadelphia, Pa. -----	795	672	796	708	682	--	(792)	336	813	674	650	492	453	558	(676)	692	700	660	590	399	--	--	--	814	748	720	562	762	576	360	718	644	---	
Pittsburgh, Pa. -----	--	--	844	774	--	--	(483)	798	574	628	--	606	399	530	352	476	549	494	--	--	--	--	318	717	766	758	746	640	723	454	366	729	593	---
Washington, D.C. (WBCO) -----	706	802	828	820	731	589	822	568	849	792	716	758	751	752	735	676	740	666	551	745	708	498	595	--	--	806	850	784	810	666	664	--	722	

The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continu-

ous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in *Illuminating Engineering*, Vol. XLVI No. 2, pages 59 to 62.

NWRC, Asheville, N.C. --- 10/30/53 --- 2000



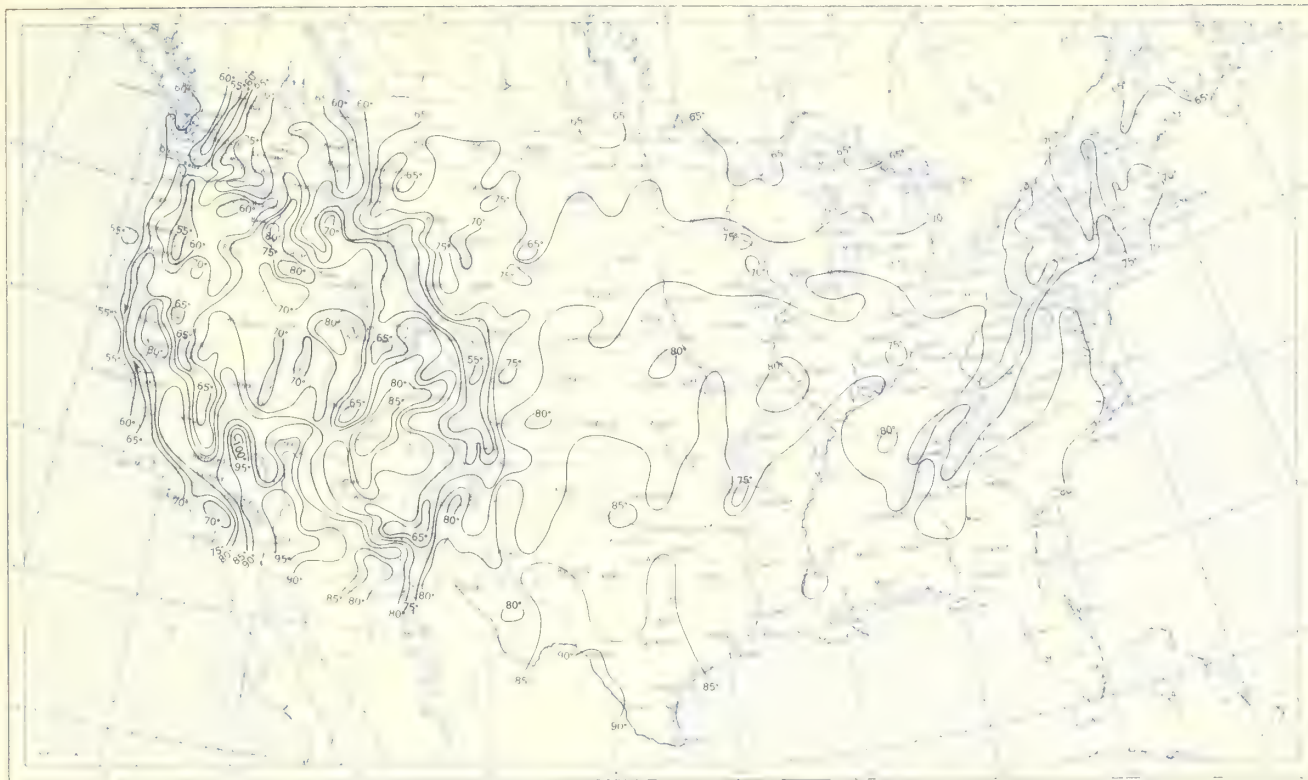




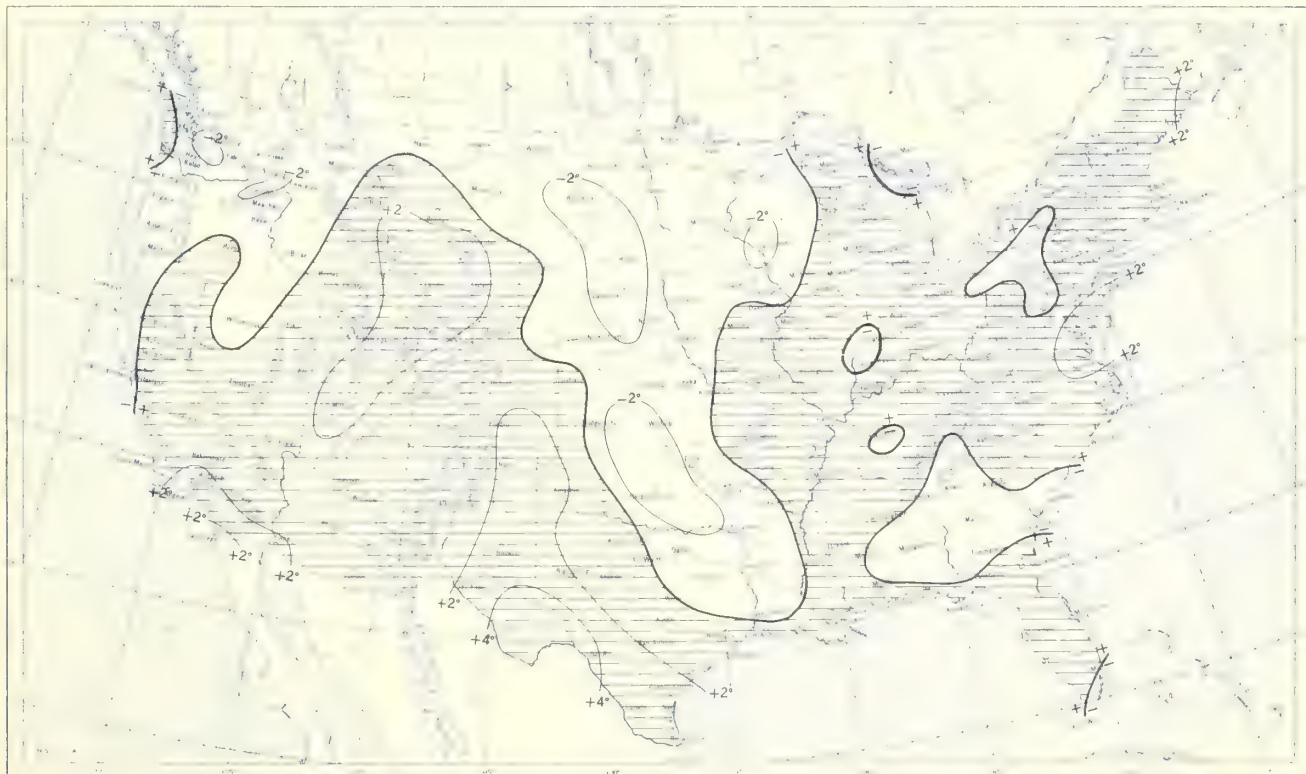




Chart I. A. Average Temperature ( $^{\circ}\text{F.}$ ) at Surface, July 1953.



B. Departure of Average Temperature from Normal ( $^{\circ}\text{F.}$ ), July 1953.

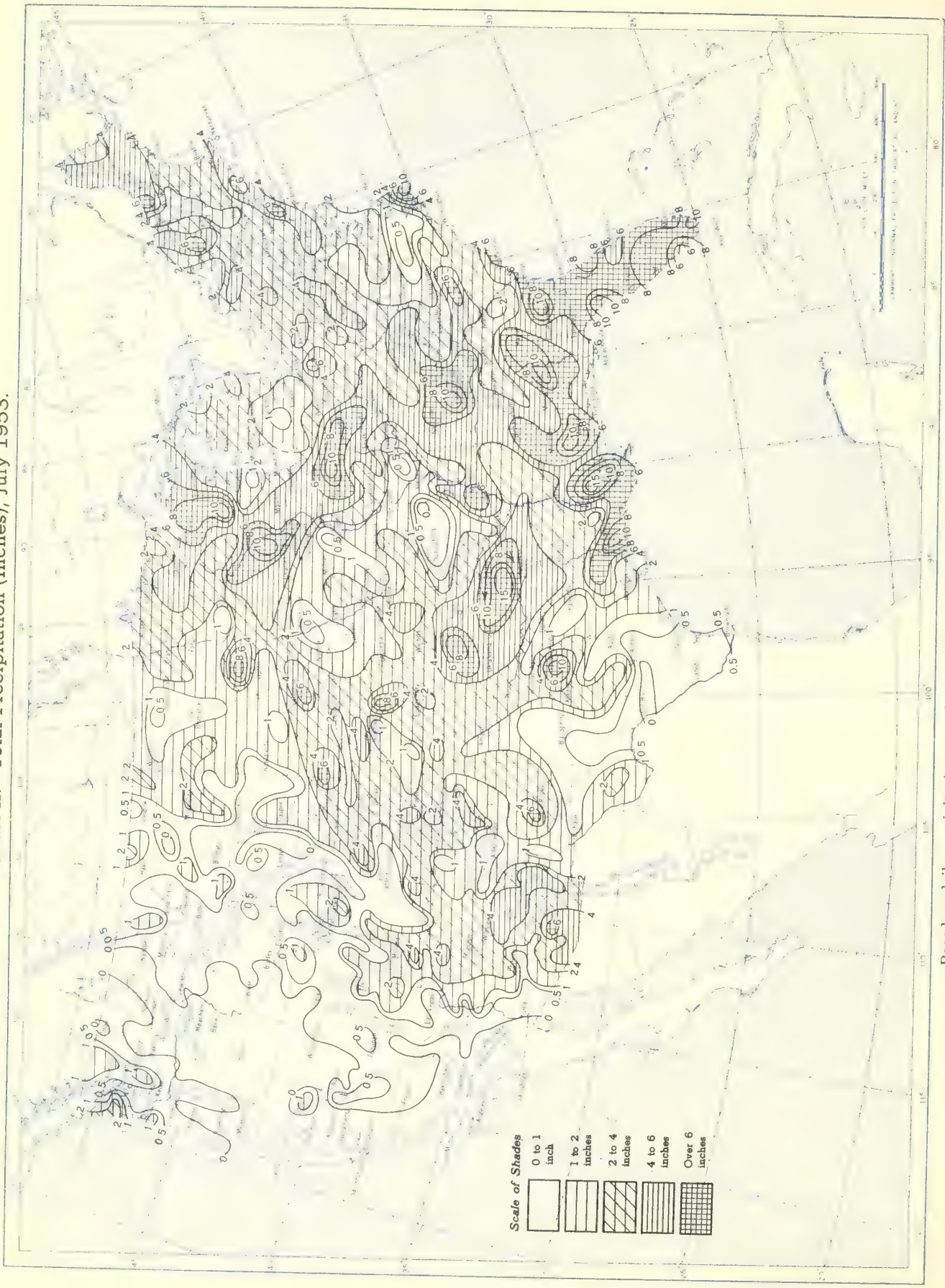


A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

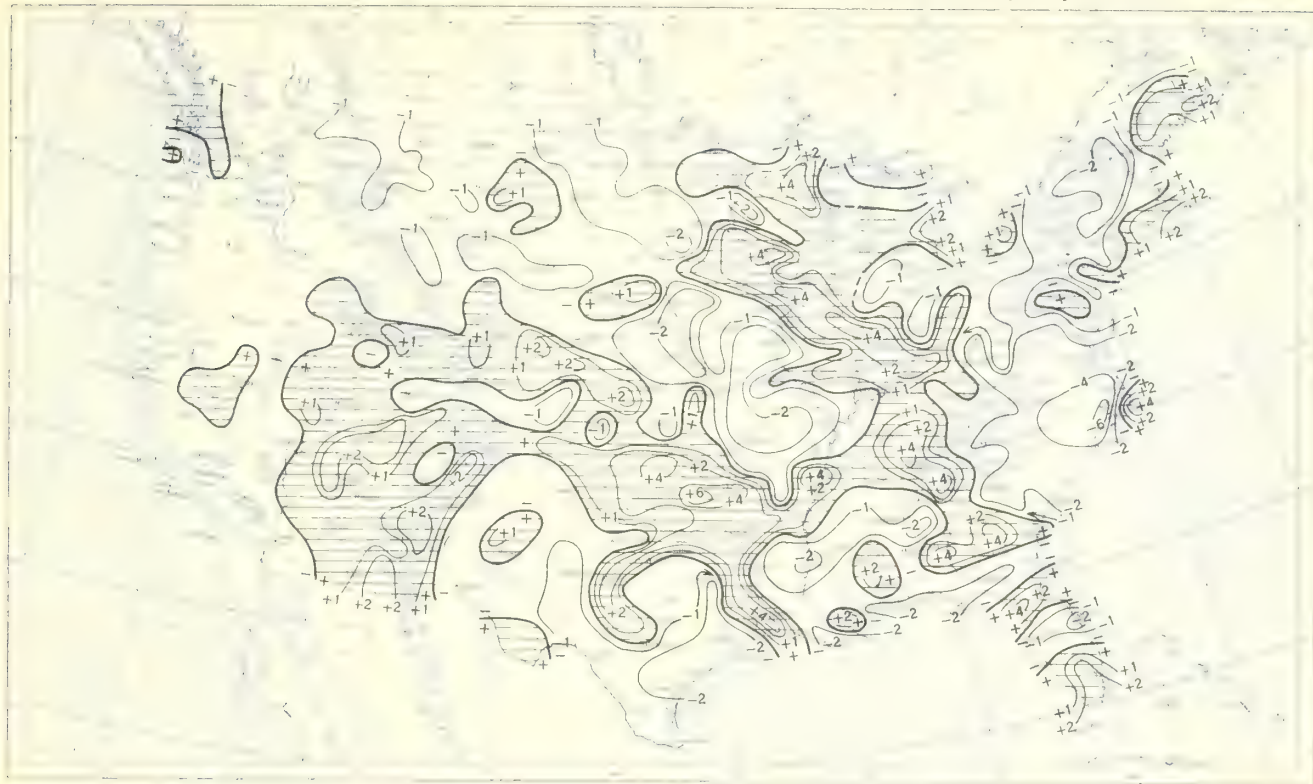


Chart II. Total Precipitation (Inches), July 1953.

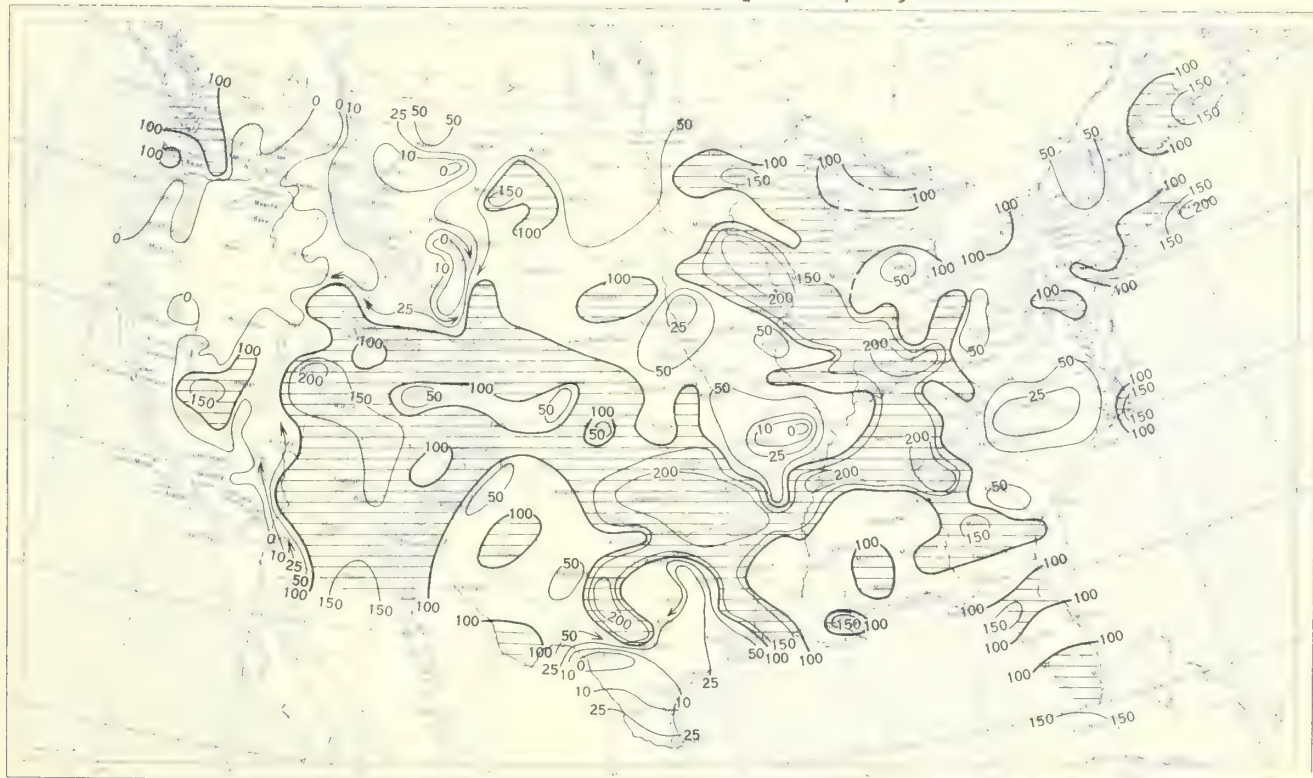


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), July 1953.



B. Percentage of Normal Precipitation, July 1953.



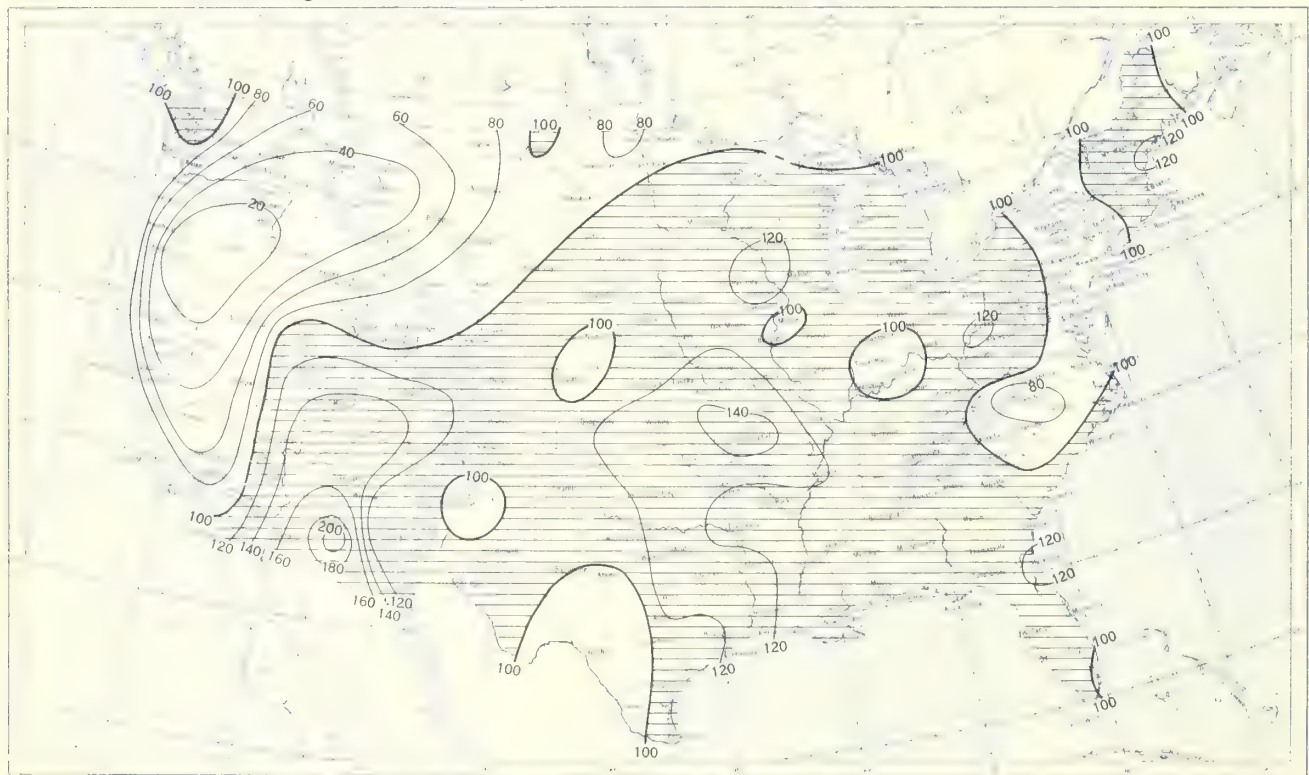
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.



Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, July 1953.

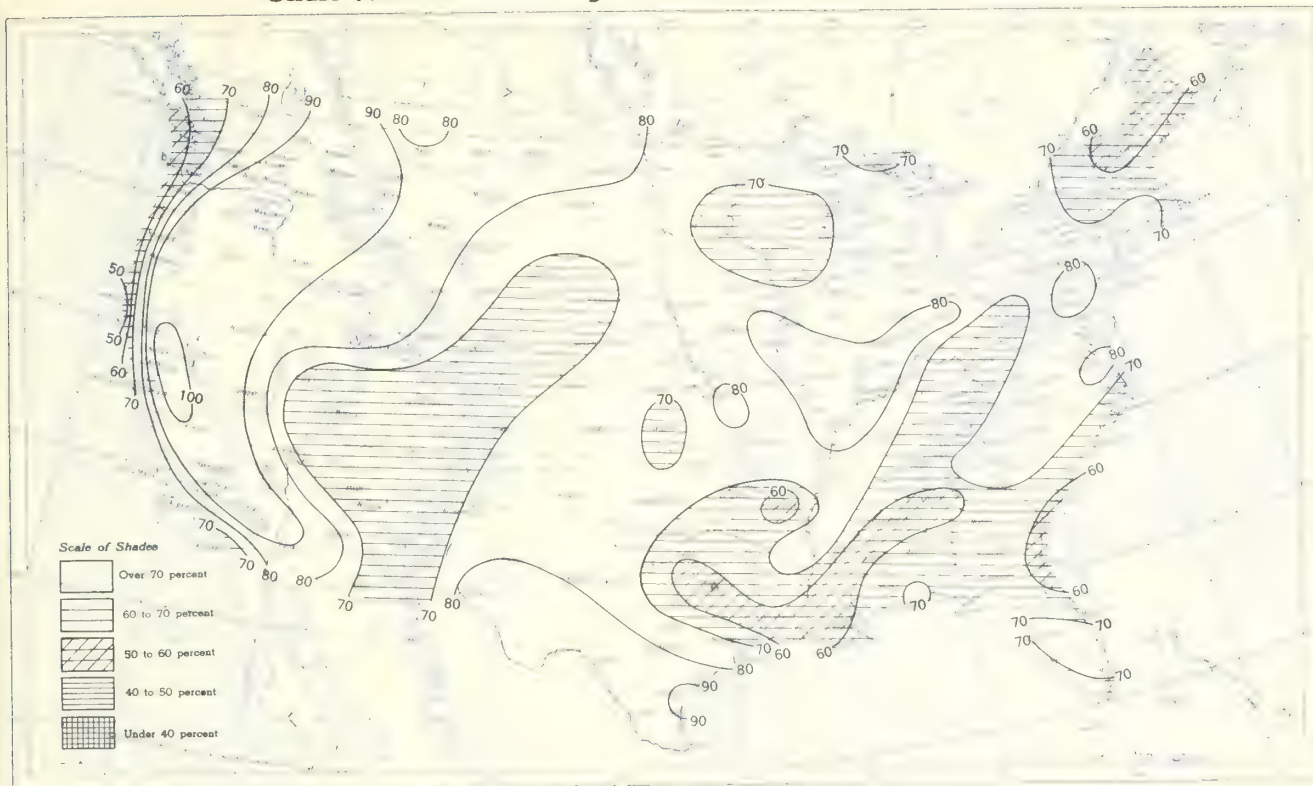


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, July 1953.

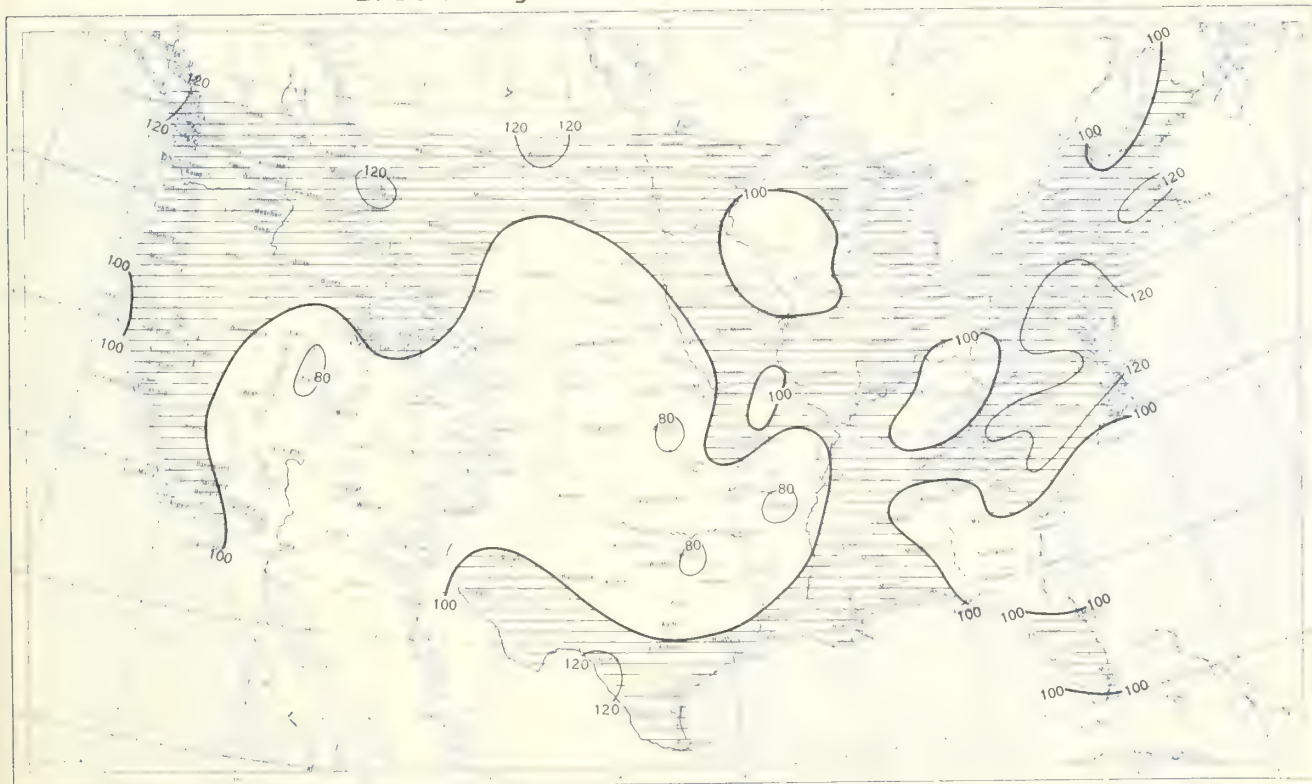


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, July 1953.



B. Percentage of Normal Sunshine, July 1953.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.



Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, July 1953. Inset: Percentage of Normal Average Daily Solar Radiation, July 1953.

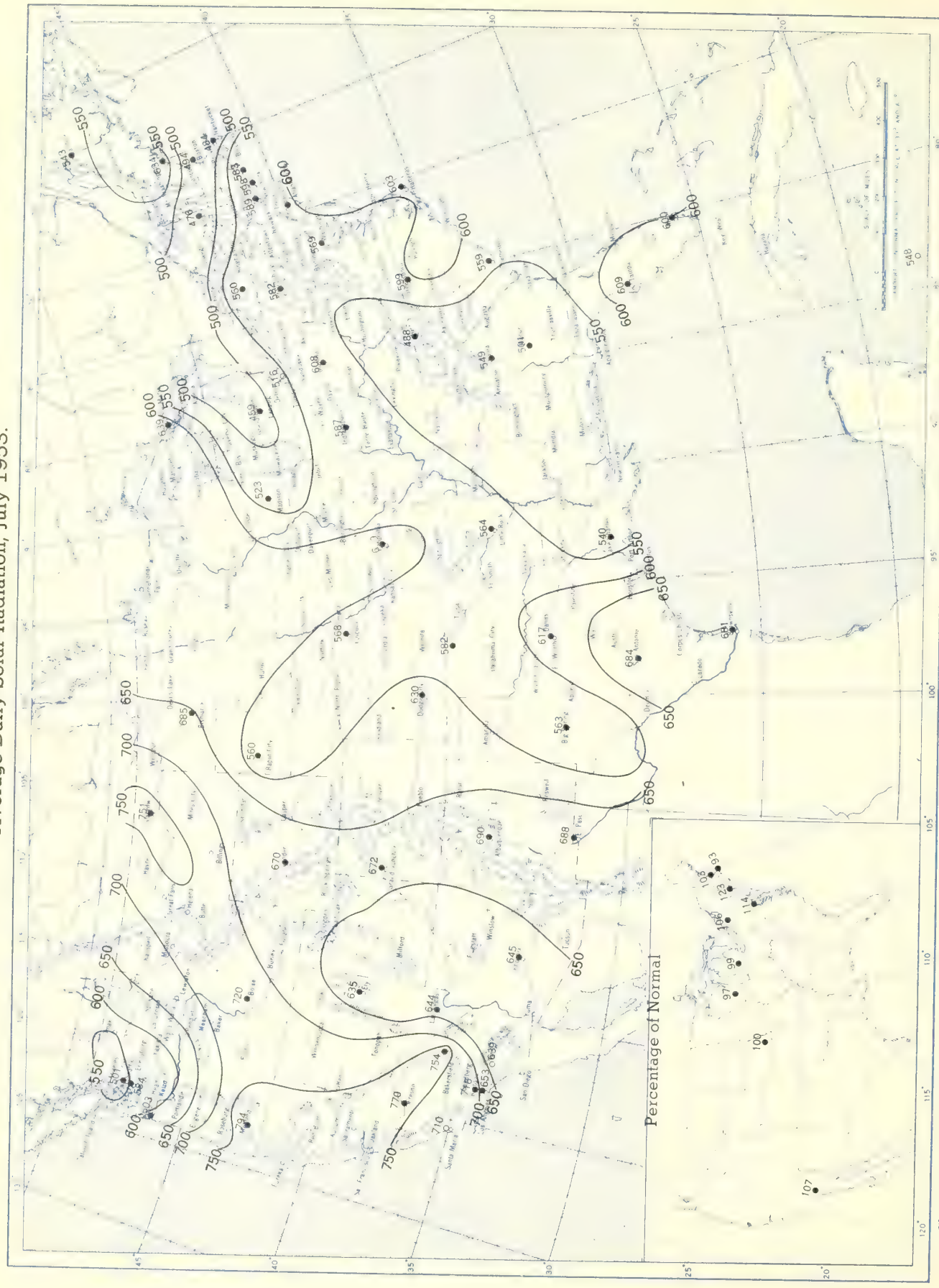
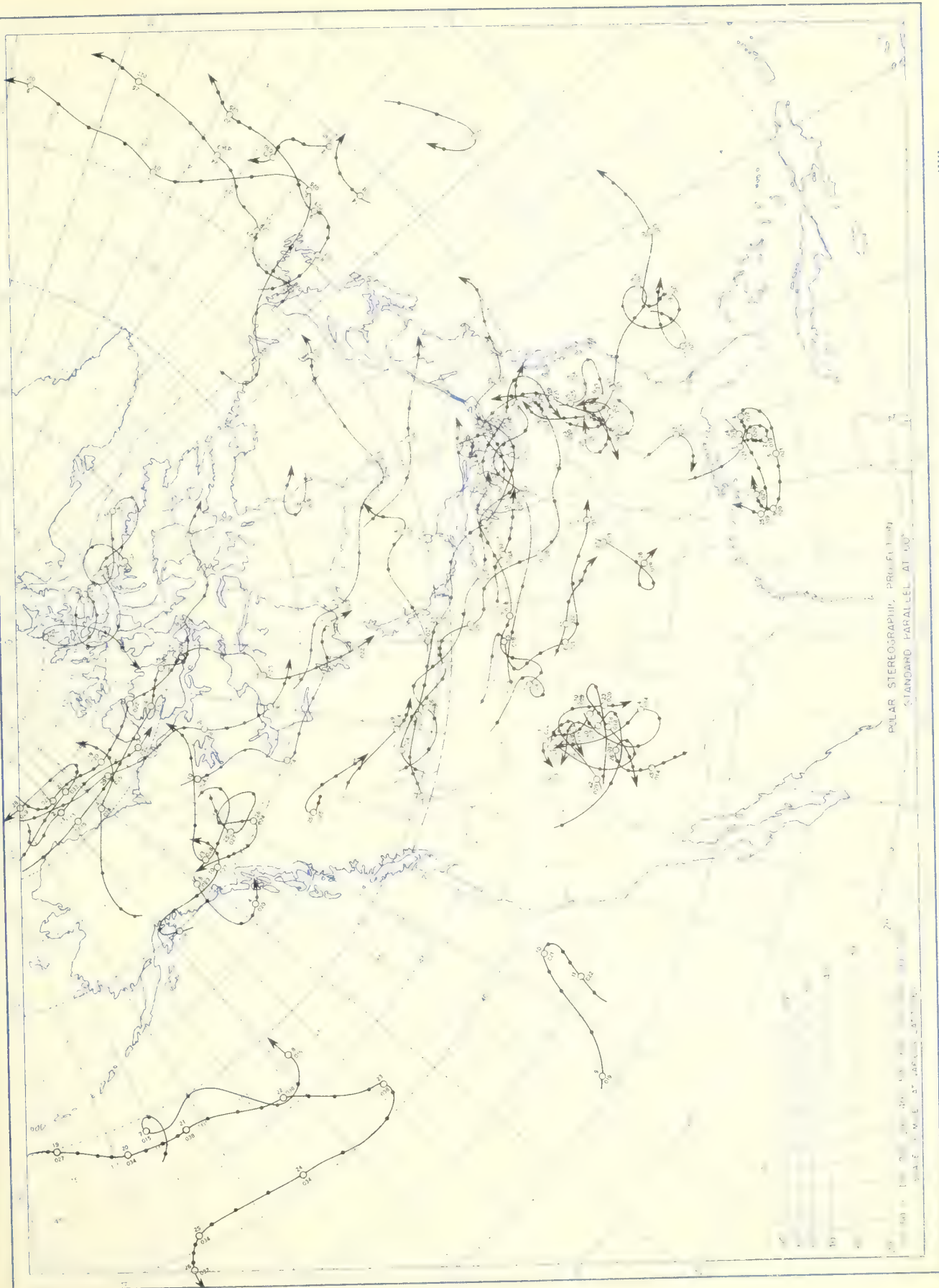


Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langley (1 langley = 1 gm. cal. cm. <sup>-2</sup>). Basic data for isotherms are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals

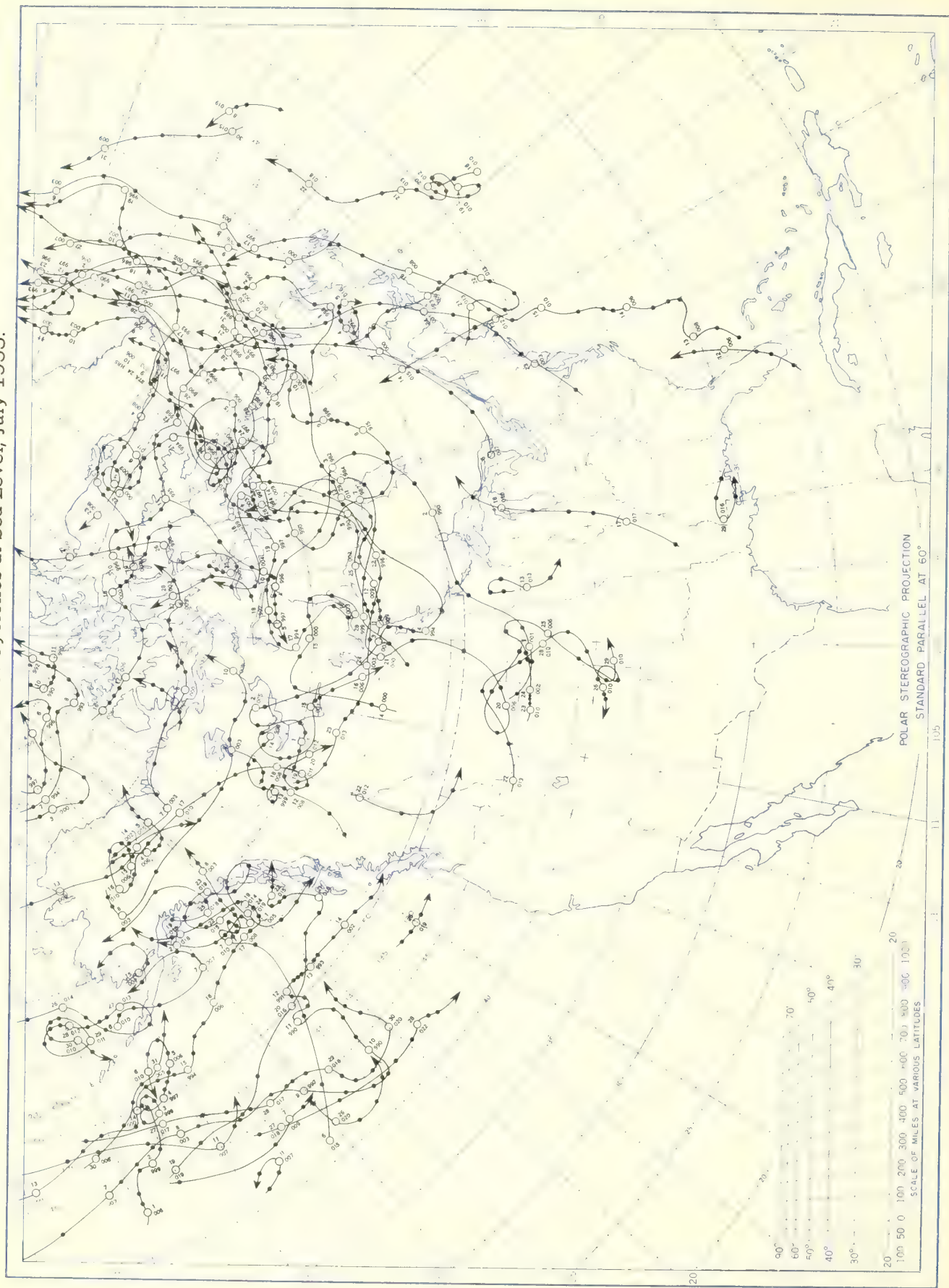
Chart IX. Tracks of Centers of Anticyclones at Sea Level, July 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

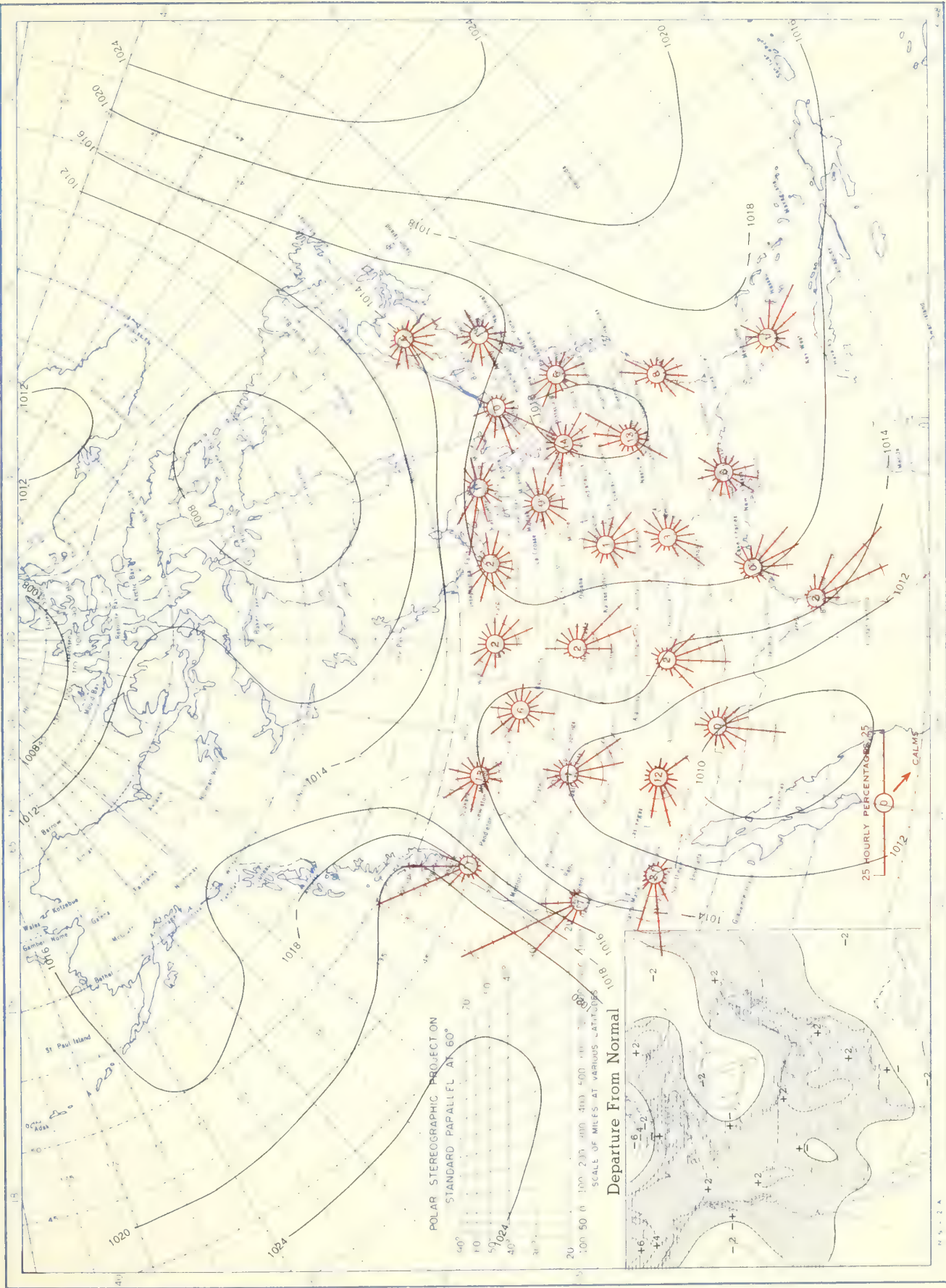


Chart X. Tracks of Centers of Cyclones at Sea Level, July 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

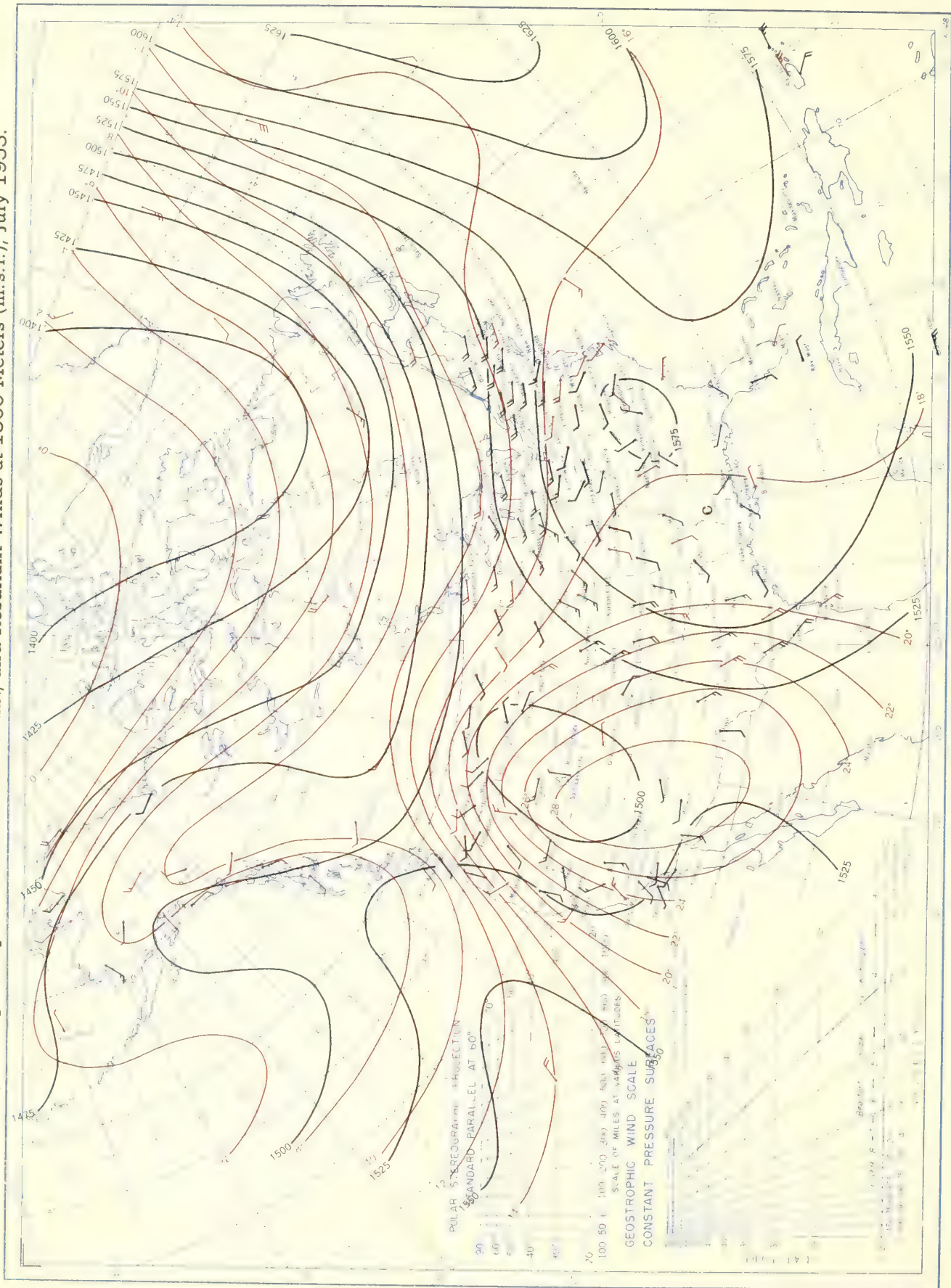
Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, July 1953. Inset: Departure of Average Pressure (mb.) from Normal, July 1953.



Average sea level pressures are obtained from the averages of the 7:30 a.m. and 7:30 p.m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° inter-sections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

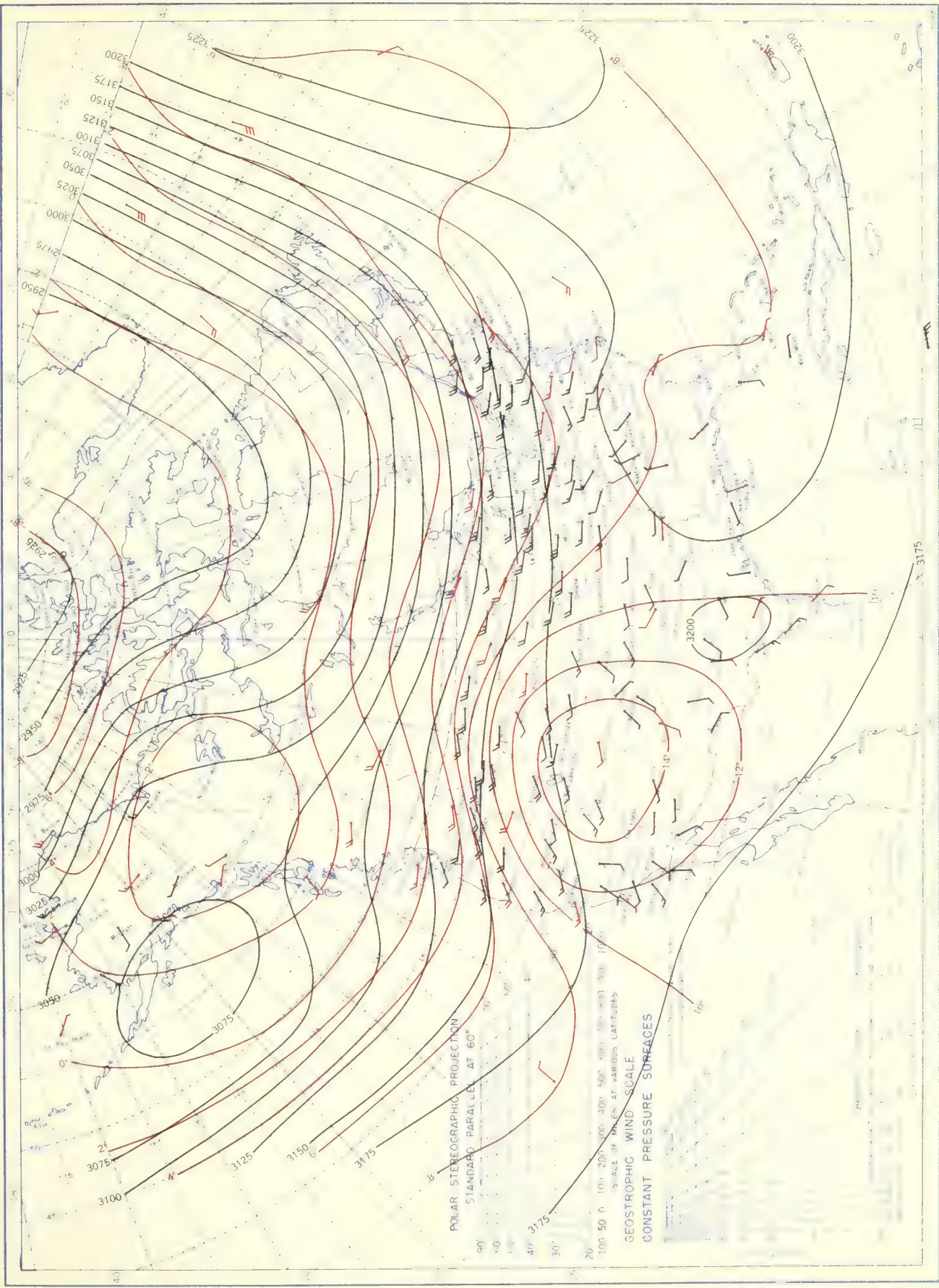


Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), July 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), July 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

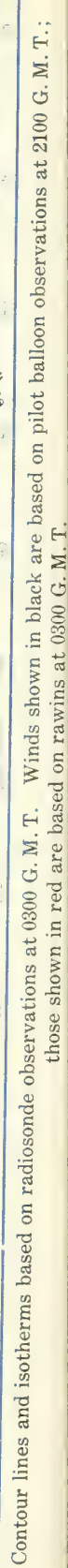
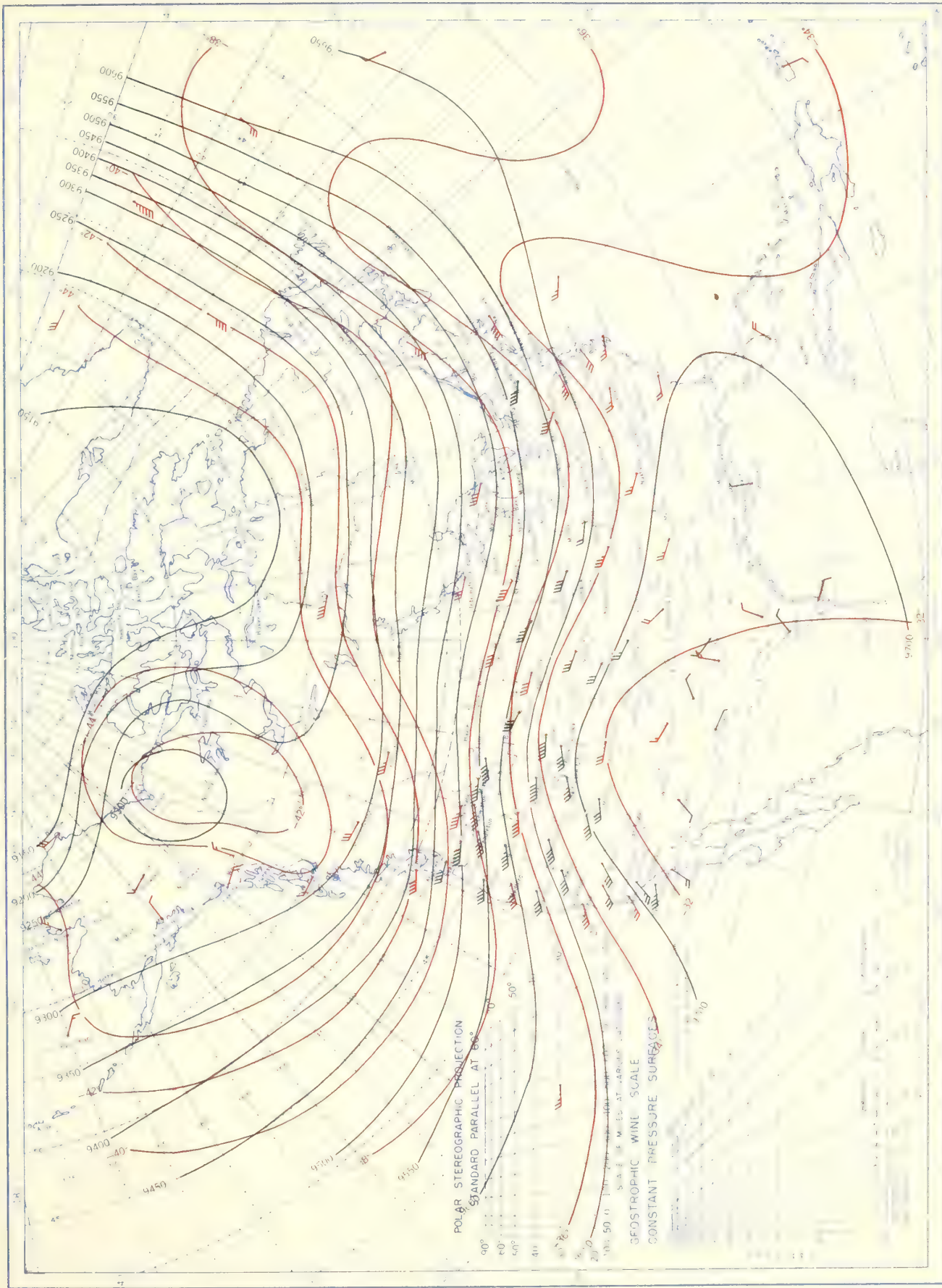


Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), July 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.



U. S. Department of Commerce

WEATHER BUREAU

Official Business

Permit No. 1024

Clemson College  
Clemson  
South Carolina

CD

Penalty for private  
use to avoid pay-  
ment of postage  
\$300.

U. S. DEPARTMENT OF COMMERCE  
SINCLAIR WEEKS, Secretary  
WEATHER BUREAU  
F. W. REICHELDERFER, Chief

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

AUGUST 1953  
Volume 4 No. 8





# C O N T E N T S

SURFACE DATA	Page
General Summary of Weather Conditions-----	263
Condensed Climatological Data - States-----	265
Climatological Data - Stations-----	266
Heating Degree Days-----	271
Severe Storms-----	272
General Summary of River and Flood Conditions-----	286
Flood Stage Data-----	287

## UPPER AIR DATA

Radiosonde Data-----	288
Pilot Balloon Data-----	291
Rawin Data-----	292

## SOLAR RADIATION DATA

Solar Radiation Intensities-----	293
Blue Hill Data-----	294
Daily Totals and Average Daily Totals by Weeks-----	295
Daily Illumination on a Horizontal Surface-----	297

## CHARTS I-XV

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

SUBSCRIPTION PRICE: Monthly and annual, 15 cents per copy; yearly subscription, including monthly and annual issues, \$1.50. Checks and money orders should be made payable to the "Treasurer of the United States." Remittance and correspondence regarding subscriptions should be sent to "Superintendent of Documents, Government Printing Office, Washington 25, D.C."

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

Volume 4 No. 8

AUGUST 1953

### GENERAL SUMMARY OF WEATHER CONDITIONS

Second only to the continued drought in the eastern half of the Country, the most important feature of August's weather was a record late-season heat wave in the northeastern quarter. While this intensified the drought's effects in the Northeast, however, heavy rains fell in other places: flood-producing falls in the extreme Upper Mississippi Valley in the first week; torrential hurricane downpours about the middle of the month along the Atlantic Coast; and heavy Gulf-Coast falls late in the month that broke the drought in southern Texas and caused local flooding there and in southern Louisiana. The nationwide temperature average continued above normal for the third consecutive month, although August was unusually cool in the Pacific States as it has been since February. August sunshine was slightly deficient along the Gulf Coast, in many sections of the Great Plains, and in the Pacific States except southern California. Sunshine in California ranged from 99 percent of the possible amount at Fresno, in the Central Valley, to only 38 percent at Eureka, on the northern coast. Above normal in most other sections of the Country sunshine was particularly abundant in the Northeast where Binghamton, N. Y. recorded 142 percent of the normal. Thunderstorms this month were fewer than usual in Arkansas, Missouri, Iowa, and east of the Mississippi River, but an above normal number occurred in the Rocky Mountain region.

**PRECIPITATION.**--Deficient rainfall east of the Rockies dimmed the overall crop outlook, but thanks to previous rains prospects remained good for major crops in north-central regions, including the central and northern portions of the main Corn Belt. The rainfall deficiency was most pronounced in an area extending eastward from Missouri and Iowa and adjoining portions of neighboring states. In most of this area the month's fall was less than 25 percent of normal and in nearly all of it less than 50 percent. Statewide averages of less than 50 percent occurred in Missouri (35%), Tennessee (26%), Illinois (34%), Kentucky (43%), and Pennsylvania (44%). Monthly totals were the lowest of August record at Knoxville, Tenn. (0.88 inch, least in 83 years); Raleigh, N. C. (1.02 inches, least since 1887); Binghamton, N. Y. (0.61 inch, least in 63 years); and Rome, Ga. (0.52 inch, least since 1876); and several scattered stations received only traces or none at all. Benefits of some rains in this general area in the first decade were lost during the dry spell that followed when the August records of consecutive rainless days were broken at such widely scattered stations as New York City (14 days), Chicago, Ill. (19 days), and Evansville, Ind. (23 days).

The poor condition of crops in western Texas, Missouri, portions of the states adjoining the Ohio River, and in the Virginia-North Carolina area reflected the cumulative effect of deficient summer rainfall, which was less than 25 percent of normal in southern Missouri and less than 50 percent in the other areas. By the end of August

Missouri pastures were useless and emergency pasture crops mostly failures. Also corn was maturing with poorly filled ears, cotton bolls were smaller than usual, soil was too dry for seeding fall grains, and the shortage of water for livestock was becoming a serious problem as wells, ponds, and streams went dry. Crop conditions in the Piedmont region of Virginia and North Carolina were equally bad, and in the latter State the State Department of Agriculture blamed the drought for crop losses estimated at \$200,000,000.

Statewide average rainfall was above normal in Michigan, Wisconsin, and Minnesota. Heavy rains fell in these States during the first decade of the month, particularly in their northern portions, and additional light to locally heavy amounts occurred during the closing days. Duluth, Minn., recorded a monthly total of 9.04 inches (a new August record). Greater monthly totals ranged up to 12.96 inches at Sandy Lake Dam, Minn., and 11.64 inches at Danbury, Wis. Floods in northern Minnesota, resulting from heavy rains during the first decade, caused damage estimated at \$327,500 in Duluth on the 5th and 6th, \$566,000 (mostly to crops) in the Aitkin area where flooding began on the 5th and continued through the 23d, and additional crop damage in the Root and Yumthro River Valleys estimated at \$50,000.

The heavy rains that fell along the Atlantic Coast during the passage of hurricane "Barbara" from the 13th to the 15th ranged up to about 6 inches in North Carolina, 11 in Virginia, 9 in Maryland, 7 in Delaware, 8 in New Jersey, 5 on Long Island, New York, and tapered off to an inch or two in southern New England. At 50 to 100 miles inland these rains amounted to no more than a sprinkle.

Most of the heavy rainfall in the South was associated with a front that remained there from about the middle until the end of the month. Greatest monthly totals in the Gulf States were: Texas, 17.33 inches; Louisiana, 11.95; Mississippi, 11.53; Alabama, 10.61; Georgia, 17.25; and Florida, 19.89. The drought in southern Texas was broken by heavy rains that began along the upper Coast on the 19th and spread over the remaining southern sections of the State during the rest of the month. During the week ending the 24th over 5 inches of rain fell at a number of stations in the lower Rio Grande Valley, causing a 5- to 6-foot rise in the Rio Grande River at Eagle Pass; and the River was again flowing at Brownsville on the 28th for the first time in nearly 6 months. These heavy rains furnished ample irrigation water in the lower Rio Grande Valley, but caused floods in a 5-county area around Corpus Christi and in the towns of Kingsville, Alice, Falfurrias, Bishop, Robstown, and Sinton, where a total of 2,300 families were forced to evacuate their homes. Light to moderate showers in other parts of the State steadily reduced the total drought area, although severe drought still persisted in some western sections.

Although spotty in the Rocky Mountain States,



# GENERAL SUMMARY OF WEATHER CONDITIONS—Continued

AUGUST 1953

rainfall was sufficient to improve crops in Colorado and Utah. In the Pacific States the fall for the month (most of it during the first and last week) was seasonably heavy except in southern California. The statewide average for Oregon (1.42 inches) which is over 300 percent of normal and the fourth highest August average on record improved ranges but caused some losses of seed crops in western counties.

**TEMPERATURE.**--In the northeastern quadrant of the Country high temperatures during the last decade intensified the bad effects of the dry weather upon crops. Maximum temperatures (highest of the summer at many stations) were in the 90's and at some stations exceeded 100°. The mercury rose to 95° or higher on five consecutive days (a new all-time record) at New York City and to 90° or above on 8 consecutive days (equalling the all-time record) at Chicago, Ill.

High temperatures also prevailed in Texas during the first 11 days of the month. The average maximum for the State was 102° on the 11th. At Corpus Christi a 94° maximum on the 19th ended a 92-day period with maximum temperatures of 90° or above.

The month was unseasonably cool in the Pacific States and nearby sections of Idaho and Nevada. Monthly averages were below normal, owing principally to unusually low daytime temperatures. At Fresno, Calif., the average daily maximum (91°) was the lowest on record for August, and the average temperature for the month (75.5°) was the lowest since 1900. The lowest August maximum

temperature ever recorded at Red Bluff, Calif. (66°), occurred on the 29th.

The summer (June, July, August) of 1953 has been unusually cool in the Pacific States and warmer than normal east of the Rocky Mountains. In the lower San Joaquin Valley of California the growing season has been one of the coolest on record.

The hottest weather occurred in the southern third of the Country during the first decade, in the other two-thirds about the middle of the month west of the Divide and during the last decade east of it. The lowest temperatures of the month at scattered stations along the Canadian Border and in many sections of the far West occurred during the first week, in Tennessee and parts of surrounding states on the 9th or 10th, and in most other sections on the 18th, 19th or 20th. Extreme temperatures for the month ranged from 120° in Death Valley, Calif. (Cow Creek on the 19th, and Greenland Ranch on the 8th and 20th), to 23° at Fraser, Colo., on the 13th.

**DESTRUCTIVE STORMS.**--Storm damage for August, less than usual, totaled a little under \$9,000,000. Most of the damage was caused by hail in the north-central interior. Only two states reported damage exceeding \$1,000,000 - Montana, slightly over \$1,800,000 of which \$1,500,000 was caused by hail; and North Carolina, about \$1,300,000 of which \$1,100,000 was caused by hurricane "Barbara" on the 13th.

# CONDENSED CLIMATOLOGICAL SUMMARY

AUGUST 1953

Table 1

Section	Temperature						Precipitation							
	Average	Departure from normal	Station	Monthly extremes				Average	Departure from normal	Monthly extremes				
				Highest	Date	Station	Lowest			Date	Station	Greatest	Station	Least
°F.	°F.	°F.		°F.		In.	In.	In.		In.				
Alabama	79.5	-0.2	2 Stations	102	°7	Valley Head	51	29	2.43	-2.16	Mobile WB AP	10.61	Sylvania	0.00
Arizona	78.0	-1.3	Gila Bend	116	18	Fort Valley	31	6	1.63	-1.48	Crown King	6.31	Littlefield	.00
Arkansas	79.6	-1.4	Conway	106	4	Gilbert	45	°20	1.59	-2.00	Danville	4.05	2 Stations	.00
California	72.7	-1.8	2 Stations	120	°8	Boca	26	4	.25	+1.10	Crescent City	3.06	206 Stations	.00
Colorado	65.9	.0	Holly	104	29	Fraser	23	13	2.02	+1.12	Holyoke	6.50	Conejos 3NNW	.05
Connecticut	69.4	+1.3	Waterbury	100	31	Shepaug Dam	33	6	1.91	-2.20	Putnam Lake	3.52	Salisbury	.49
Delaware	74.2	-1.2	2 Stations	101	°30	2 Stations	49	19	6.65	+1.81	Millsboro	11.21	Newark College Farm	1.87
Florida	81.3	-1.1	De Funiak Springs	102	6	Niceville	63	15	9.51	+2.39	2 Stations	19.89	Marianna CAA AP	1.74
Georgia	79.6	-1.2	Louisville	104	°6	Blairsville Exp. Sta.	47	28	3.84	-1.43	Brunswick CAA AP	17.25	Fairmount	T
Idaho	66.7	+1.1	Grand View	109	12	Three Creek	22	25	.54	-.04	Porthill	2.44	3 Stations	.00
Illinois	75.5	+1.9	Alton Dam 26	106	1	3 Stations	44	°19	1.12	-2.24	Paris Water Works	3.70	Ste. Marie	.09
Indiana	74.3	+1.6	Evansville	104	31	Wheatfield	41	18	2.06	-1.26	Angola	7.60	Johnson Exp. Farm	.14
Iowa	73.2	+1.6	2 Stations	104	1	2 Stations	41	20	2.33	-1.43	Decorah	6.15	Tracy	.15
Kansas	77.3	-1.0	Meade	107	11	Oberlin	48	21	2.03	-1.08	Mingo SE	5.83	Pittsburg	.23
Kentucky	76.0	+1.2	Golden Pond 8N	104	16	2 Stations	44	°19	1.54	-2.13	Keene 2N	6.22	Albany	.08
Louisiana	81.2	-1.7	2 Stations	104	°8	Tallulah Delta Lab.	57	10	4.65	-.06	Atchafalaya	11.95	Lake Providence	.10
Maine	65.1	-1.1	Portland	97	30	Greenville	35	21	3.13	-.10	Jonesboro	5.18	Houlton CAA AP	1.38
Maryland	74.0	+1.6	Keedysville	107	31	Oakland	37	21	3.81	-.61	Snow Hill	12.28	Hancock Fruit Lab.	.76
Massachusetts	68.5	-2.2	Walpole 1S	104	31	2 Stations	36	3	2.61	-1.05	Plymouth	5.71	South Egremont	.46
Michigan	69.1	+2.0	Port Huron	101	30	Vanderbilt Trout Sta.	31	18	2.96	+1.03	Bergland Hydro Plant	7.42	Glen Arbor L. School	.77
Minnesota	70.0	+2.8	2 Stations	99	°26	2 Stations	40	°17	4.67	+1.39	Sandy Lake Dam Libby	12.96	Argyle	.77
Mississippi	79.9	-1.9	Clarksdale	103	14	Ripley	52	20	3.13	-.95	Tylertown	11.53	Okolona 2E	.00
Missouri	77.7	+1.2	3 Stations	105	°14	Waynesville 2W	43	19	1.31	-2.47	Elsberry	4.52	Siloam Springs	T
Montana	66.6	+1.5	Rexford RS	107	19	Wisdom	23	25	1.02	-.09	Boyes	5.98	Campbell Farm Camp 4	T
Nebraska	74.5	+1.2	2 Stations	106	1	Gordon 1E	41	12	1.93	-.79	Newcastle	5.83	Brewster	.19
Nevada	70.2	-1.3	Overton	114	°8	Fish Creek Rch.	29	31	.38	-.12	Boulder City	1.92	3 Stations	.00
New Hampshire	65.0	-.6	Windham	98	°29	Fabyan	29	3	4.04	+1.53	Alexandria	8.29	Windham	2.21
New Jersey	72.4	+1.3	3 Stations	103	31	Layton 3NW	38	20	3.42	-1.27	Cape May 3W	10.38	Wanaque Raymond Dam	.96
New Mexico	71.9	-1.1	Jal	110	1	Eagle Nest	29	7	1.64	-.69	Sedan	5.68	2 Stations	.00
New York	67.3	.0	West Point	103	31	Speculator	27	3	3.06	-.54	Tupper Lake Sunmount	7.38	do	.35
North Carolina	76.4	+1.1	Moncure 2SE	104	3	2 Stations	42	°10	4.47	-1.08	Morehead City	17.27	Rougemont	.28
North Dakota	69.6	+2.6	Maddack Agr. School	103	31	3 Stations	39	°7	1.78	-.29	Peabina 2N	5.03	Bottineau	.17
Ohio	72.8	+1.1	Milford	104	31	Tom Jenkins Dam	38	19	2.10	-1.21	Montpelier	6.09	3 Stations	.52
Oklahoma	79.7	-2.2	2 Stations	110	°10	2 Stations	51	°20	2.30	-.62	Holdenville	8.73	Foraker	.00
Oregon	64.6	-1.0	The Dalles	107	15	Fremont	24	10	1.42	+1.98	Gold Beach RS	4.83	Sheaville	.03
Pennsylvania	70.4	+1.4	4 Stations	103	31	Kane 1NNE	33	19	1.94	-2.11	Clermont	7.82	Orwell 3N	.31
Rhode Island	69.2	-1.1	Providence WB AP	95	31	Kingston	44	19	4.13	+1.37	Block Island WB AP	5.31	Greenville	2.10
South Carolina	79.0	+1.1	McColl	105	3	Long Creek 1N	50	23	4.41	-1.31	Georgetown	12.83	Gaston Shoals	.16
South Dakota	72.2	+1.1	2 Stations	106	26	Deerfield Dam	28	7	2.80	+1.69	Armour	8.17	Smithwick 6SW	.38
Tennessee	77.1	+1.3	do	104	°16	2 Stations	46	20	.94	-3.00	Mount Le Conte	4.65	6 Stations	.00
Texas	82.0	-1.2	Boquillas Ranger Sta.	115	10	Mount Locke	51	30	3.42	+1.07	San Benito	17.33	Forsan	T
Utah	69.6	-1.3	3 Stations	105	°7	Clear Creek	28	11	1.22	+1.10	Moon Lake	3.86	2 Stations	.00
Vermont	64.8	-1.6	Bellows Falls	98	°30	5 Stations	33	°1	3.67	+1.16	Reading Hill	5.83	Dorset 1S	2.52
Virginia	75.0	+1.0	2 Stations	106	31	Burkes Garden	40	25	3.16	-1.31	Onley 1S	15.01	Holston	.08
Washington	65.4	-.6	do	106	°15	2 Stations	32	°1	1.42	+1.71	Rainier Paradise RS	4.70	Smyrna	.16
West Virginia	72.0	+1.2	3 Stations	103	°30	Canaan Valley	33	21	2.53	-1.52	Parsons 2	8.26	Mathias	.77
Wisconsin	69.6	+2.2	Whitewater	101	31	3 Stations	35	°17	3.99	+1.55	Danbury	11.64	Monroe 1W	1.05
Wyoming	65.8	+1.2	Morrisey	103	24	Bondurant	25	31	1.28	+1.23	Colony 1SE	4.48	Deaver	.23
Puerto Rico	79.2	+1.2	Juncos	98	°9	San Lorenzo (Espino)	51	8	7.54	+1.31	Penuelas (Salto Garzas)	15.15	Culebra Island	2.54

° Other dates also.



## CLIMATOLOGICAL DATA

Table 2

AUGUST 1953

State and station	Elevation (ground)	Pressure			Temperature										Precipitation					Wind					No. of days											
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days	Snow, Sleet, Hail	Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile	Speed	Direction	Date	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine				
ft	mb	mb	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	in.	in.	in.	0.1 inch or more	With thunderstorms	Total	in.	in.	M	M	M	M	M	0-3	4-7	8-10	0-10	%			
<b>ALABAMA</b>																																				
Birmingham	610	993.2	1018.0	91	68	79.5	+0.4	97	14	60	10	20	0	65	66	2.80	-1.75	1.31	11	8	0.0	0	6.1	NE	46	SW	8	12	14	5	4.6	69				
Mobile	211	1009.1	1016.9	90	72	80.9	+1.1	98	5	67	9	21	0	72	82	10.61	+4.86	3.03	15	16	0.0	0	7.5	NE	---	---	---	7	16	8	6.6	---				
Montgomery CO	201	---	---	91	71	81.2	+0.0	98	16	63	23	19	0	---	---	2.89	-1.14	2.20	6	5	0.0	0	4.6	NE	---	---	---	14	8	11	12	5.5	67			
Montgomery	198	1009.5	1016.7	92	70	81.0	+1.1	100	8	61	24	22	0	68	70	1.78	-2.97	1.09	6	6	0.0	0	4.6	NE	25	S	14	8	11	12	5.5	67				
<b>ARIZONA</b>																																				
Flagstaff	6993	---	---	78	47	62.6	-8.8	89	7	36	6	0	0	---	---	4.21	+1.61	1.45	8	13	0.0	0	6.2	---	---	---	---	---	14	7	10	4.7	---			
Phoenix CO	1083	---	---	104	77	90.5	+1.6	110	18	66	31	31	0	---	---	5.3	---	2.4	3	7	0.0	0	---	---	---	---	---	20	---	---	---	90				
Phoenix	1114	971.6	1009.5	102	76	89.3	+1.0	108	6	64	31	31	0	58	38	3.1	-6.68	1.9	3	7	0.0	0	4.7	E	*32	SSE	20	21	10	0	2.3	---				
Prescott	5014	849.6	1013.6	87	58	72.4	-1.5	97	7	48	31	11	0	46	48	3.63	-1.07	1.24	12	17	0.0	0	9.2	SW	28	SW	8	16	8	7	4.1	79				
Tucson	2558	924.5	1010.1	99	73	86.4	+2.6	105	6	68	31	31	0	52	35	4.6	-1.69	2.1	7	13	0.0	0	6.9	SE	38	E	7	18	11	2	3.3	86				
Winslow	4880	853.7	1011.9	90	60	75.2	+2.2	98	7	52	31	19	0	46	40	2.31	-1.69	1.73	10	12	0.0	0	8.0	SE	*32	WNW	14	15	12	4	3.7	---				
Yuma	199	1003.4	1008.2	107	80	93.2	-5.5	114	17	67	30	31	0	59	35	0.02	-4.48	0.02	1	1	0.0	0	8.9	SSE	29	S	8	27	3	1	1.3	97				
<b>ARKANSAS</b>																																				
Fort Smith	458	999.7	1016.1	92	67	79.4	-2.7	97	11	57	21	24	0	66	69	2.52	-1.10	1.58	5	5	0.0	0	6.5	NE	29	NE	16	21	6	4	3.3	80				
Little Rock	257	1003.7	1016.4	93	70	81.5	+2.2	99	4	63	10	22	0	66	65	2.67	-1.48	1.52	4	5	0.0	0	7.5	E	36	SW	17	18	8	5	3.7	73				
Texarkana	361	1003.1	1016.1	91	70	80.8	-1.9	98	7	64	20	21	0	70	75	2.90	+0.02	1.95	6	10	0.0	0	5.4	NE	---	---	---	12	12	7	4.8	---				
<b>CALIFORNIA</b>																																				
Bakersfield	489	995.3	1012.9	91	63	77.2	-4.6	101	10	56	3	20	0	53	44	---	-0.01	---	0	0	0.0	0	5.5	WNW	*17	WNW	*6	28	2	1	.6	---				
Bishop	4108	872.7	1011.5	95	50	72.6	-9.1	103	11	42	29	28	0	---	---	0.03	-1.11	0.2	2	4	0.0	0	---	---	---	---	---	---	27	4	0	1.0	---			
Blue Canyon	5280	841.2	1014.5	72	54	63.0	-4.3	86	11	42	29	0	0	---	---	0.34	+2.29	0.4	1	1	0.0	0	---	---	---	---	---	---	25	13	12	6	4.6	---		
Burbank	699	987.5	1013.5	86	59	72.2	-1.4	95	18	55	24	11	0	55	62	0.00	-0.02	0.0	0	0	0.0	0	3.6	S	*15	ESE	11	22	9	0	2.5	---				
Eureka CO	43	1015.2	1017.6	63	54	58.8	+1.8	69	25	50	25	0	0	---	---	4.1	+3.30	1.9	7	0	0.0	0	6.4	---	---	---	---	---	15	3	9	7.6	38			
Fresno	331	1000.7	1012.1	91	60	75.5	-4.0	101	9	54	4	21	0	55	52	---	-0.00	---	0	0	0.0	0	6.5	WNW	17	NW	*1	28	2	1	.6	99				
Los Angeles CO	312	---	---	81	61	70.7	-2.2	87	26	57	24	0	0	---	---	0.00	-0.02	0.0	0	0	0.0	0	5.1	---	---	---	---	---	11	21	10	0	2.4	84		
Los Angeles	99	1009.8	1013.5	73	60	66.8	-1.4	76	1	57	27	0	0	59	78	---	-0.02	---	0	0	0.0	0	6.2	WSW	126	W	28	10	14	7	4.7	---				
Mt. Shasta	3543	892.7	1015.0	80	49	64.1	-1.7	94	11	40	4	5	0	---	---	0.15	+0.02	0.3	1	0	0.0	0	---	---	---	---	---	---	16	11	4	3.5	---			
Oakland	3	1015.6	1015.8	70	56	63.0	+1.8	85	8	52	25	0	0	56	81	---	+0.07	0.9	2	0	0.0	0	7.9	W	22	W	25	13	12	6	4.6	---				
Red Bluff	341	1000.3	1012.7	91	63	77.0	-3.5	106	10	53	30	21	0	50	43	---	+0.05	1.0	1	0	0.0	0	8.1	SSE	30	SE	25	22	6	3	2.2	86				
Sacramento	17	1012.2	1013.4	87	56	71.1	-2.1	99	9	51	4	11	0	54	59	---	+0.07	0.7	1	0	0.0	0	9.7	SSW	26	SW	*1	27	3	1	1.3	91				
Sandberg CO	4517	863.5	1012.7	83	58	70.8	-2.7	94	11	43	29	10	0	38	36	---	-0.10	---	0	0	0.0	0	13.3	NW	---	---	---	---	---	---	---	---	---			
San Diego	19	1010.2	1013.4	76	64	69.9	-4.4	91	25	56	16	0	0	60	74	---	-0.05	---	0	0	0.0	0	6.6	WNW	17	SW	*1	15	11	5	4.2	61				
San Francisco CO	52	---	---	65	54	59.5	+2.2	75	22	51	1	0	0	---	---	0.07	+0.06	0.5	3	0	0.0	0	11.0	---	---	---	---	---	24	7	12	5.9	53			
San Francisco	1	1015.2	1015.8	69	55	62.1	+1.5	82	8	49	23	0	0	54	80	---	+0.02	0.2	2	0	0.0	0	13.6	WNW	35	WNW	*3	16	15	0	3.2	---				
Santa Maria	231	1006.4	1015.1	71	52	61.4	-1.0	78	22	46	22	0	0	53	80	---	-0.03	---	0	0	0.0	0	6.1	W	*20	WNW	*3	16	15	0	3.2	---				
<b>COLORADO</b>																																				
Alamosa	7534	776.8	1019.2	80	43	61.8	-0.8	86	8	36	30	0	0	---	---	0.62	-0.48	0.46	6	7	0.0	0	---	---	---	---	---	---	20	9	2	3.4	---			
Colorado Springs	6175	815.1	1015.8	81	55	67.8	-1.9	90	26	45	20	1	0	47	54	---	1.88	0.81	6.8	17	19	0.0	0	9.4	SE	*30	N	10	11	4	4.3	---				
Denver	5292	839.5	1013.8	85	58	71.2	-1.1	95	26	50	20	15	0	47	48	---	1.25	-1.18	7.5	7	9	0.0	0	9.3	N	29	N	2	16	4	4.3	75				
Grand Junction	4849	861.2	1014.2	86	59	72.6	-3.0	95	7	53	23	13	0	45	43	---	1.81	+1.61	1.21	12	11	0.0	0	9.3	ESE	38	W	21	15	6	10	4.4	63			
Pueblo	4799	858.8	1014.5	89	60	74.1	+8.8	97	9	53	20	16	0	52	55	---	2.16	+3.38	1.75	11	11	0.0	0	6.5	NW	36	SW	22	15	14	2	3.9	71			
<b>CONNECTICUT</b>																																				
Bridgeport	7	1016.6	---	82	63	72.5	+8.8	98	29	53	19	6	0	---	---	1.81	-2.62	1.00	5	0	0.0	0	---	---	---	---	---	---	13	14	4	4.2	---			
Hartford	15	1011.2	1017.1	83	60	71.3	+9.9	98	31	49	20	5	0	60	72	---	1.71	-1.96	0.91	9	2	0.0	0	5.4	S	20	S	4	10	13	8	5.2	77			
New Haven	6	1013.2	1016.9	79	61	70.0	+2.2	97	29	50	19	1	0	---	---	1.84	-2.27	1.27	7	1	0.0	0	5.8	---	---	---	---	---	7	12	13	6	4.7	73		
<b>DELAWARE</b>																																				
Wilmington	73	1013.9	1017.2	86	63	74.5	+7.7	101	30	53	19	9	0	62	71	---	1.89	-3.39	1.03	5	4	0.0	0	6.6	NNW	---	---	---	---	---	17	5	9	4.4	---	
<b>FLORIDA</b>																																				
Apalachicola	13	1014.6	1015.9	86	75	80.4	-9.9	92	4	70	*3	5	0	---	---	8.67	+1.19	2.35	18	20	0.0	0	7.0	---	---	---	---	---	24	E	22	4	10	17	7.4	48
Daytona Beach	33	1015.2	1016.9	88	73	80.6	-3.2	97	4	70	15	13	0	74	87	19.89	+4.07	3.52	19	22	0.0	0	7.8	SSW	*40	E	10	4	9	18	7.3	---				
Fort Myers	15	1015.9	1016.2	91	73	82.4	-1.1	94	4	70	20	25	0	74	81	4.32	-3.49	1.43	18	25	0.0	0	6.2	E	*24	W	7	3	17	11	6.6	---				
Jacksonville CO	18	---	---	88	74	81.1	-4.4	98	3	69	24	11	0	---	---	16.55	+0.29	4.09	22	---	0.0	0	---	---	---	---	---	---	---	---	---	---	---	---		
Jacksonville	52	1016.3	1017.1	90	73	81.6	-2.2	98	1	68	24	16	0	72	81	12.36	+5.93	3.80	21	13	0.0	0	7.9	SW	35	NE	30	2	10	19	7.6	41				
Kissimmee CO	5	1014.6	1015.2	91	78	84.6	+7.7	94	*24	74	17	26	0	---	---	1.90	-2.77	1.60	11	11	0.0	0	6.6	---	---	---	---	---	31	3	22	6	7.7	61		
Lakeland CO	214	---	---	89	73	81.1	-5.6	94	1	71	16	17	0	---	---	9.03	+1.90	1.47	26	26	0.0	0	5.3	---	---	---	---	---	1	12	18	7.5	---			
Melbourne	22	---	---	89	73	81.1	-4.4	93	7	69	22	14	0	---	---	10.88	+5.49	2.87	22	20	0.0	0	---	---	---	---	---</									

## 453

AUGUST 1953

See footnotes at end of table.



## CLIMATOLOGICAL DATA

Table 2—Continued

AUGUST 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation										Wind				No. of days																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max 90° F or above Min 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days 0.1 inch or more With thunderstorms	Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
																			In.	In.											M. p. h.	M. p. h.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O	With	In.	In.	M.	M.	O

## CLIMATOLOGICAL DATA

Table 2-Continued

AUGUST 1952

State and station	Elevation (ground) Ft.	Pressure			Temperature										Precipitation										Wind			No. of days (sunrise to sunset)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max 90° F or above	Min 32° F or below	Average dew point	Average relative humidity		Total	Departure from normal	Greatest in 24 hours	0.1 inch or more	With thunderstorms	Total	Max depth on ground	Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
															%	In.																		In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.



## CLIMATOLOGICAL DATA

Table 2—Continued

AUGUST 1953

State and station	Elevation (ground)	Pressure			Temperature										Precipitation										Wind				No. of days (sunrise to sunset)		Possible sunshine																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal				No. of days Max 90° F. or above Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
							°F	°F	°F	°F							°F	°F	°F	°F			°F	°F					°F	°F		°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°

Data from airport unless otherwise specified. CO indicates data from city office.

\* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

° Other dates also.

† Peak gust.

# Max. 70° F. or above for Alaskan stations.

# HEATING DEGREE DAYS

(Base 65°F.)

AUGUST 1953

Table 3

State and station	Current season		Normals	July through this month	State and station	Current season	Normals	July through this month	State and station	Current season	Normals	July through this month	State and station	Current season	Normals	July through this month
	This month	Period July through this month														
ALABAMA					INDIANA (Cont'd.)				NEVADA (Cont'd.)				SO. DAKOTA (Cont'd.)			
Birmingham	0	0	0	0	Indianapolis (CO)	0	0	0	Las Vegas	0	0	0	Rapid City	6	8	56
Mobile	0	0	0	0	Indianapolis	0	1	0	Reno	42	46	88	Sioux Falls	4	10	37
Montgomery (CO)	0	0	0	0	South Bend	0	12	18	Tonopah	21	21	5				
Montgomery	0	0	0	0	Terre Haute	0	0	5	Winnemucca	49	54	17	TENNESSEE			
ARIZONA					IOWA				NEW HAMPSHIRE				Bristol	0	0	0
Flagstaff	84	106	127	127	Burlington	0	1	0	Concord	54	66	68	Chattanooga	0	0	0
Phoenix (CO)	0	0	0	0	Charles City (CO)	1	8	17	Mt. Washington	567	1056		Knoxville	0	0	0
Phoenix	0	0	0	0	Des Moines	0	0	17				Memphis	0	0	0	
Prescott	1	1	0	0	Dubuque	2	6	36	NEW JERSEY				Nashville	0	0	0
Tucson	0	0	0	0	Keokuk (CO)	0	0	0	Atlantic City (CO)	0	0	0	TEXAS			
Winslow	0	0	0	0	Stout City	2	2	25	Newark	0	0	0	Abilene	0	0	0
Yuma	0	0	0	0	KANSAS				Trenton (CO)	0	0	0	Amarillo	0	0	0
ARKANSAS					Concordia (CO)	0	0	0	NEW MEXICO				Austin	0	0	0
Ft. Smith	0	0	0	0	Dodge City	0	2	0	Albuquerque	0	0	0	Big Spring	0	0	0
Little Rock	0	0	0	0	Goodland	2	2	0	Clayton	1	1	0	Brownsville	0	0	0
Texarkana	0	0	0	0	Topeka (CO)	0	0	0	Raton	16	20	53	Corpus Christi	0	0	0
CALIFORNIA					Topeka	0	0	8	Roswell	0	0	0	Dallas	0	0	0
Bakersfield	0	0	0	0	Wichita	0	1	0					Del Rio	0	0	0
Bishop	4	4	0	0	KENTUCKY				NEW YORK				El Paso	0	0	0
Blue Canyon	117	121	77	77	Lexington	0	0	0	Albany	20	27	24	Ft. Worth	0	0	0
Barbank	0	0	0	0	Louisville (CO)	0	0	0	Binghamton	40	67	79	Galveston (CO)	0	0	0
Eureka (CO)	185	485	515	515	Louisville	0	0	0	Buffalo	8	17	46	Galveston	0	0	0
Fresno	0	0	0	0	Pikeville (CO)	0	0	0	New York (CO)	0	0	0	Houston (CO)	0	0	0
Los Angeles (CO)	0	0	0	0	LOUISIANA				La Guardia Field	0	0	0	Houston	0	0	0
Los Angeles	0	1	53	53	Baton Rouge	0	0	0	Rochester	18	32	43	Lubbock	0	0	0
Mt. Shasta (CO)	88	94	83	83	Lake Charles	0	0	0	Schenectady	7	7	29	Port Arthur	0	0	0
Oakland	70	126	161	161	New Orleans (CO)	0	0	0	Syracuse	17	28	29	San Angelo	0	0	0
Red Bluff	5	5	0	0	New Orleans	0	0	0				San Antonio	0	0	0	
Sacramento (CO)	5	5	0	0	Int. Airport, Moisant	0	0	0	Asheville (CO)	0	0	0	Victoria	0	0	0
Sacramento	4	4	0	0	Shreveport	0	0	0	Asheville	0	5	0	Waco	0	0	0
Sandberg (CO)	40	40	0	0	MAINE				Charlotte	0	0	0	Wichita Falls	0	0	0
San Diego	0	0	18	18	Caribou	152	234	218	Greensboro	0	0	0	UTAH			
San Francisco (CO)	160	393	366	366	Eastport (CO)	134	208	277	Hatteras	0	0	0	Milford	4	4	0
San Francisco	87	231	280	280	Greenville (CO)	116	170	71	Raleigh (CO)	0	0	0	Salt Lake City (CO)	0	0	0
San Jose	15	19	18	18	Portland	69	87	71	Raleigh	0	0	0	Salt Lake City	0	0	0
Santa Maria	105	184	192	192	MARYLAND				Wilmington	0	0	0	VERMONT			
COLORADO					Baltimore (CO)	0	0	0	Winston-Salem	0	0	0	Burlington	49	57	66
Alamosa	98	122	185	185	Baltimore	0	0	0	NORTH DAKOTA				LYNNBURG			
Colorado Springs	24	33	29	29	Frederick	1	1	0	Bismarck	4	21	66	Lynchburg	0	0	0
Denver	0	0	16	16	MASSACHUSETTS				Devils Lake (CO)	19	55	108	Norfolk	0	0	0
Grand Junction	0	0	0	0	Boston	2	4	7	Fargo	4	24	66	Richmond	0	0	0
Pueblo	1	1	0	0	Milton	26	41	56	Grand Forks	12	43	66	Roanoke	0	0	0
CONNECTICUT					Nantucket	31	48	88	Pembina	20	51	71	WASHINGTON			
Bridgeport	1	1	0	0	Pittsfield	72	116	88	Williston (CO)	8	31	71	Ellensburg	49	54	30
Hartford	10	10	14	14	MICHIGAN				OHIO				Kelso	74	164	169
New Haven	9	13	18	18	Alpena (CO)	24	60	135	Cincinnati (CO)	0	0	0	Olympia	89	184	174
DELAWARE					Detroit	1	6	8	Cincinnati	0	0	6	Seattle (CO)	25	58	94
Wilmington	0	0	0	0	Escanaba (CO)	12	47	157	Cleveland (CO)	2	3	9	Seattle	77	181	145
DIST. OF COLUMBIA					Grand Rapids (CO)	1	4	20	Cleveland	3	5	10	Spokane	44	55	45
Washington (CO)	0	0	0	0	Grand Rapids	7	17	43	Columbus	3	8	8	Tatoosh Island (CO)	242	518	583
Washington	0	0	0	0	Lansing	11	28	46	Dayton	0	0	5	Walla Walla (CO)	3	3	0
FLORIDA					Marquette (CO)	47	90	156	Sandusky (CO)	0	0	0	Yakima	26	34	7
Apalachicola (CO)	0	0	0	0	Muskegon	8	29	74	Toledo	0	4	12	WEST VIRGINIA			
Daytona Beach	0	0	0	0	Sault Ste. Marie	60	163	235	Youngstown	12	34	19	Charleston	1	1	0
Fort Myers	0	0	0	0	Ypsilanti	2	6	0	OKLAHOMA				Elkins	24	42	40
Jacksonville (CO)	0	0	0	0	MINNESOTA				Oklahoma City (CO)	0	5	0	Huntington (CO)	0	0	0
Jacksonville	0	0	0	0	Duluth (CO)	53	129	157	Oklahoma City	0	5	0	Parkersburg (CO)	0	0	0
Key West (CO)	0	0	0	0	Duluth	45	102	147	Tulsa	0	2	0	Petersburg (CO)	0	3	5
Key West	0	0	0	0	International Falls	43	119	188	OREGON				WISCONSIN			
Melbourne	0	0	0	0	Minneapolis	2	5	25	Astoria	117	254	47	Green Bay	9	28	90
Miami (CO)	0	0	0	0	Rochester	10	19	62	Burns (CO)	62	70	67	La Crosse	0	1	31
Int. Airport, Hialeah	0	0	0	0	St. Cloud	7	27	85	Eugene	41	80	67	Madison (CO)	0	4	40
Miami Beach	0	0	0	0	MISSISSIPPI				Meacham	153	253	190	Madison	1	3	44
Orlando	0	0	0	0	Jackson	0	0	0	Medford	25	25	0	Milwaukee (CO)	0	5	35
Pensacola (CO)	0	0	0	0	Meridian	0	0	0	Pendleton	14	15	0	Milwaukee	0	2	52
Tallahassee	0	0	0	0	Vicksburg (CO)	0	0	0	Portland (CO)	20	35	27	WYOMING			
Tampa	0	0	0	0	MISSOURI				Portland	41	73	47	Casper	8	14	37
West Palm Beach	0	0	0	0	Columbia	0	0	6	Roseburg	26	39	47	Cheyenne	24	34	72
GEORGIA					Kansas City	0	0	5	Salem	44	96	144	Lander	12	15	30
Albany	0	0	0	0	St. Joseph	0	0	0	Sexton Summit (CO)	175	269	157	Rock Springs (CO)	10	10	
Athens	0	0	0	0	St. Louis (CO)	0	0	0	PENNSYLVANIA				Rock Springs	21	22	52
Atlanta (CO)	0	0	0	0	St. Louis	0	0	0	Allentown	5	7	9	Sheridan	12	12	68
Atlanta	0	0	0	0	Springfield	0	0	8	Erie (CO)	0	2	17	ALASKA			
Augusta	0	0	0	0	MONTANA				Harrisburg	0	0	0	Anchorage	256	396	
Columbus	0	0	0	0	Billings	7	7	28	Park Place (CO)	27	42	71	Annette Island	206	432	
Macon	0	0	0	0	Glasgow (CO)	0	2	44	Philadelphia (CO)	0	0	0	Barrow	940	1770	
Rome	0	0	0	0	Great Falls	17	38	74	Philadelphia	0	0	0	Bethel	356	544	
Savannah	0	0	0	0	Havre (CO)	6	25	58	Pittsburgh (CO)	8	13	20	Cordova	367	672	
Valdosta	0	0	0	0	Helena	35	46	102	Reading (CO)	0	0	5	Fairbanks	273	401	
IDAHO					Kalispell	91	158	130	Scranton (CO)	17	20	18	Juneau	307	542	
Boise	14	16	0	0	Miles City	2	3	17	Williamsport	7	9	16	Kotzebue	468	896	
Lewiston	18	18	0	0	Missoula	62	89	79				McGrath	335	468		
Pocatello	1	1	0	0	NEBRASKA				RHODE ISLAND				Nome	463	887	
ILLINOIS					Grand Island	0	1	6	Block Island	6	13	27	Northway	348	504	
Cairo (CO)	0	0	0	0	Lincoln (CO)	0	0	7	Providence	13	16	26	St. Paul	464	949	
Chicago (CO)	0	0	0	0	Lincoln	0	0	12	SOUTH CAROLINA				Yakutat	339	643	
Chicago	0	0	0	0	Norfolk	0	0	17	Charleston (CO)	0	0	0				
Chicago University	0	0	0	0</												



## SEVERE STORMS

Table 4

AUGUST 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Plentywood, Mont.	1	12:01 a.m.					Consider- able	Some	Rain	Heavy rain caused a creek to overflow and flood city.
Grand Junc- tion, Colo.	1	2:43-6:55 a.m.							do	Flooded streets and basements, and damaged pavements to a considerable extent in city and surrounding area.
Milwaukee, Wis.	1	A.m. and p.m.					\$125,000		Electri- cal, wind, and rain	Lightning and fire caused \$85,000 damage to school. Trolley and utility wires down in parts of city. Basements flooded by heavy rain in some sections.
Wisconsin, portions of	1	A.m. and p.m.							Electri- cal, wind, and hail	A series of thunderstorms caused scattered property damage in State. Reports of barns and other build- ings damaged by lightning; also damage to utility lines from lightning or wind. Hail caused some dam- age in cranberry bogs near Mather. Damage probably exceeded \$100,000 in State, exclusive of damage at Milwaukee and Waupun.
Waupun and vicinity, Wis.	1	2:45 p.m.					200,000		Wind	Damaged many buildings, uprooted more than 100 trees, and badly disrupted power and communication lines. Utility services not fully restored for 72 hours.
Oak Hill (near), Franklin County, Mo.	1	Afternoon		8	0	0	\$5,000		Tornado	Small tornado demolished 1 barn and unroofed another; destroyed timber and some growing corn. Moved northeastward.
Brecken- ridge, Mich.	1	P.m.					20,000	\$5,000	Wind and hail	4 barns blown down. Hail shredded several fields of corn and beans.
Owosso, Mich.	1	P.m.							Wind	3 planes damaged; 1 destroyed.
Eaton Rapids, Mich.	1	P.m.					5,000		Electri- cal	Farmhouse burned.
Gratiot County, Mich.	1	6:30 p.m.					\$500,000		Wind and hail	6 barns blown down; hail shredded fields of corn, beans, and other crops in strip from St. Louis to Edgewood.
Buchanan, Mich.	1	6:40 p.m.			0	0	800	0	Electri- cal	House damaged.
Indianapolis, Ind.	1	Evening					10,000		do	Home set afire by lightning and damaged extensively.
Scott Coun- ty, Kans.	1	Evening					1,000		do	Registered Angus bull killed when struck by light- ning 8 miles north of Scott City.
Wichita County (eastern portion), Kans.	1	7 p.m.	Nar- row						Wind	Barn, windmill, and chicken house on 1 farm and 2 small buildings on another northeast of Marienthal destroyed in very local windstorm described by newspaper as small twister.
Kalamazoo, Mich.	1	7:30 p.m.					12,500		do	244-foot radio station tower blown down.
Durand (near), Mich.	1	8 p.m.					25,000		do	5 barns blown down.
Brooklyn, Mich.	1	9 p.m.					20,000		Electri- cal	3 barns burned.
Lansing, Iowa	1	Late evening					2,500		Rain	Basements, roads, and gardens flooded.
Lyon County, Iowa	1	10 a.m.					1,000		do	Washed out bridge approaches. Responsible for 2-car collision.
Jackson- ville, Mor- gan County, Ill.	1						500		Wind	14 tents at Morgan County Fair blown down.
Oakley, Idaho	1 and 2								Rain and electri- cal	Some damage to wheat crop. Several trees hit by lightning. Floods caused some damage to crops and roads.
Greenfield, Iowa	2	4:30 a.m.					150		Electri- cal	Damaged wiring.
Elk Horn, Iowa	2	Afternoon	*2				1,000	5,000	Wind, rain, and hail	Damaged buildings and crops.
Wyoming, northeast- ern portion	2	Afternoon					50,000	1,000	Rain	Basements flooded and bridges washed out.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

AUGUST 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Marshall County, Kans.	2	3 p.m.	Nar- row	3 to 4	0	0	\$5,000	\$0	Tornado	Small tornado, moving northeastward, destroyed barn and several sheds and blew over many trees 2 miles northwest of Waterville.
Wymore (near), Nebr.	2	3:30 p.m.	Nar- row	5	0	0	1,200	Little	do	A few small farm buildings demolished, no large ones in path.
Medicine Park, Co- manche County, Okla.	2	3:30-4 p.m.	Nar- row	Short		2	350		Wind	House and other buildings on farm damaged.
Comanche and vicinity, Stephens County, Okla.	2	4-4:30 p.m.					500		Wind and electrical	Wind damaged 2 barns, a house, and a garage. Minor damage by lightning to house.
Sumner Coun- ty, Kans.	2	4:30 p.m.	250	**250	0	0	11,000	115	Tornado	Small tornado, moving northward, tore roof and top story of large barn and damaged power and telephone lines near Milan, in western Sumner County. Cloud small, very dark, with no apparent funnel. At moment of strike, dust reduced visibility to zero even within the house. Debris from barn scattered 1/4 mile northward.
Johnston County, N. C.	2	6 p.m.	300	5			75,000	25,000	Wind, rain, and elec- trical	Wind destroyed community recreation building and damaged several homes, business structures, and tobacco barns in Pine Level community. Lumber mill burned. Corn and tobacco damaged in fields.
Fonda, Iowa	2	6 p.m.					1,000	10,000	Wind, rain, and hail	Damaged buildings, trees, and crops.
Storm Lake, Iowa	2	Evening					500		Wind and rain	Damaged trees and wires.
Tekamah (near), Nebr.	2	Evening					Consider- able		Wind	Large roof, 50 x 96 feet, collapsed.
Indianapolis, Ind.	2	Evening				1	2,000		do	Wind blew down pole, injuring flag-pole sitter. About \$2,000 damage to miniature golf course.
Anderson, Ind.	2						1,000		do	Wind blew down meeting tent, severely damaging organ.
Buffalo and vicinity, Harper Coun- ty, Okla.	2	8:30-9 p.m.					1,600		Wind and electrical	Wind up to 70 m.p.h. Several homes and an elevator damaged, with losses estimated at \$1,700. Lightning killed 3 calves, loss estimated at \$100.
Barber Coun- ty, Kans.	2	10 p.m.			0	0			Hail and wind (possi- ble tor- nado)	At least 7 farms suffered from hail and severe wind, described by farmers as tornadic. Greatest loss occurred on farm 4 miles northwest of Sharon, in northeastern part of County, where wind damaged 2 buildings and hail stripped feed crops.
Calmar, Iowa	3	Afternoon							Wind	Damaged trees.
Ft. Bridger, Wyo.	3	Afternoon			1				Electrical	Man struck by lightning and killed.
Grand View and McCam- mon, Idaho	3	Afternoon							Wind, rain, and hail	Branches broken, etc. Wind 42 m.p.h. at McCammon. At Grand View 70 m.p.h. west wind and hail at 3:30 a.m.
Carter Coun- ty, Ky.	3	P.m.			1	10			Electrical	Death and injuries due to lightning strike.
Forsyth Coun- ty, N. C.	3	5 p.m.					1,000	16,500	Hail	Damage to tobacco in fields.
Pleasant Gap, Mo.	3	5 p.m.			0	0	Minor	Minor	Tornado	Path confined to 2 farms.
Kidder, Mo.	3	6 p.m.			1				Electrical	Farmer killed near Kidder when struck by lightning.
Grandview Air Force Base, Mo.	3	Evening					85,000		do	Recreation center at Air Force Base destroyed by fire caused by lightning.
Stewart- ville, Mo.	3	7:30 p.m.					3,000		do	Granary and implement shed struck by lightning and burned with contents of hay, grain, and farm machinery.
Buchanan, Mich.	3	P.m.					4,000		do	Barn burned.
Zeeland, Mich.	3	10 p.m.					5,000		do	Large barn burned.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

AUGUST 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Paducah, Cottle Coun- ty, Tex.	4	4 a.m.			0	0	\$0	\$0	Tornadoes	Tornado cloud sighted 2 miles east of Paducah in sparsely settled section. Did not touch ground. Other funnels reported about 15 miles east of Paducah.
Harrisburg, Mo.	4	5 a.m.					8,000		Electri- cal	Residence destroyed by lightning.
Sparta, Mich.	4	A.m.					3,000		do	Barn burned.
Canadian, Hemphill County, Tex.	4	11 a.m.					2,000		Electri- cal and rain	Generator burned out at power plant. Prairie fire started, but soon out out by hard rain.
Roscoe, No- lan County, Tex.	4				0	0	0	0	Tornado	Tornado cloud sighted moving southward; did not touch ground.
Charleston, Mo.	4	12:30 p.m.					3,000		Wind and electrical	Residence damaged by lightning and fire. Plate-glass windows broken by wind.
Salida, Colo.	4	1-2 p.m.					2,000		Rain, hail, and electrical	Lightning damaged 2 buildings. Heavy rains washed out railroad tracks. Hail fell in surrounding mountains.
Bono, Ark.	4	1:30-2 p.m.	100				6,000		Wind	Considerable minor damage in town. Damage to corn, cotton, apples, and peaches.
Jonesboro, Ark.	4	1:40-2:15 p.m.	1,760	2			26,000	6,000	do	Extensive wind damage to buildings in city; cotton and corn damage.
Compton Com- munity, New- ton County, Ark.	4								Electri- cal	17 head of milk goats killed when lightning struck tree.
Melbourne (12 miles east of), Iz- ard Co., Ark.	4	P.m.					3,000		do	Lightning set fire to barn, destroying the building and 1,500 bales of hay.
Nashua, Mont.	4		*2	3				10,000	Hail	Damage to wheat.
Hysham, Mont.	4	3 p.m.	*2	13				50,000	do	Hailstones 1/4 to 1 inch in diameter.
Carter and Delhi areas, Beckham County, Okla.	4	3-4 p.m.	*6	6			3,000	100,000	Hail and wind	Hail, size of walnuts, caused extensive damage to cotton and grain sorghums, as well as roof and window damage. Minor wind damage not included in estimates.
Delaware community, Nowata County, Okla.	4	3:30-5 p.m.	*1/2	1 1/2			500		Wind	Damage to oil lease.
Grandfield area, Till- man County, Okla.	4	3:30-5:15 p.m.					6,000	600	Electri- cal, wind, and hail	Damages included in totals: hail to crops over 2 mile square area \$600; high wind damage to buildings \$1,000; lightning damage to buildings \$5,000.
Larsland, Mont.	4	4 p.m.	*4 to 5	12- 15				Some	Hail	Up to 10 percent damage to wheat.
Forsythe, Mont.	4	4 p.m.	*1	15				25,000	do	Storm from Howard Flats to south edge of Forsythe. Damage to small grain, sugar beets, and hay.
Hobart (near), Ki- owa County, Okla.	4	4:28-4:53 p.m.	Nar- row	Short	0	0	4,500	0	Tornado	Observed by CAA station at Hobart. Moved eastward.
Spearfish to Rapid City, Lawrence and Penning- ton Coun- ties, S.Dak.	4	5:40-8:30 p.m.					10,000	50,000	Wind, hail, and rain	Storm traveled southeastward from Spearfish to White-wood to Sturgis to near Rapid City. Hail ranged in diameter from 1/2 to 4 inches and wind estimated between 50 and 60 m.p.h. In addition to crops, damage along path mostly to window panes, signs, and cars.
Spearfish, Lawrence County, S. Dak.	4	5:40 p.m.	50	2	0	0	200		Tornado	Photograph of this tornado shows it to be well-defined funnel cloud reaching ground in hilly area near Spearfish. Another aerial photo taken after storm shows path across lower flat lands in area of Spearfish and Spearfish airport. Funnel cloud dissipated after passing airport to east, having been in formation for approximately 20 minutes. Path southeastward. Spearfish airport recorded 70 m.p.h. winds after tornado had dissipated. Airplane, tied down at Spearfish airport, damaged.

See footnotes at end of table.

# SEVERE STORMS

Table 4—Continued

AUGUST 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Cheyenne and Sherman Counties, Kans.	4	6-7:30 p.m.	*2 to 7	55			\$2,500	\$70,000	Hail	Hailstorm beginning just across Colorado line north- west of St. Francis left strip of destruction through St. Francis and into Sherman County north and east of Goodland. Windows broken in St. Francis and at a few farm homes, and crops beaten down.
Vida (10-12 miles south of), Mont.	4	6-8 p.m.	*1	4				Moderate	do	Damage to wheat.
Volborg (north of), Mont.	4		*1						do	Considerable damage to wheat and oats in places.
Turner (20 miles southeast of), Mont.	4	Evening						Light	do	Slight damage to 600 acres of wheat.
Jackson Coun- ty (eastern part), Okla.	4	6:30-6:40 p.m.	*1	2				6,000	do	Damage to cotton.
Holden, Mo.	5	1 a.m.					2,000		Electri- cal	Barn containing hay and some farm implements de- stroyed by lightning.
Fort Lauder- dale, Fla.	5				0	0	0	0	Tornado	Aircraft pilot observed funnel cloud northwest of Fort Lauderdale.
Miami Air- port, Fla.	5				0	0	0	0	do	2 or more funnel clouds west of field; did not reach ground.
Perryton, Ochiltree County, Tex.	5						*1,000		Hail and electri- cal	4 cows killed by lightning. Hail damaged feed crops northwest of Perryton.
Duluth and vicinity, Minn.	5-6	P.m. and a.m.					327,500		Rains	Flooded basements, streets, roads, and highways. Sewers overflowed and culverts and bridges washed out. Much soil erosion occurred.
Decatur County, Kans.	5	5-6 p.m.					Slight	5,000	Hail	Heavy hail north and east of Oberlin damaged crops, ripped screens, and broke a few windows.
Wagstaff (near), Mi- ami County, Kans.	5	6 p.m.					1,200	500	Electri- cal	Large hay and stock barn and contents of hay, oats, and tools burned after being struck by lightning.
Knobs, Mont.	5	6 p.m.	*1	10				Severe	Hail	About 90 percent damage to wheat.
Marshall County, S. Dak.	5	6-6:30 p.m.	*3	17	0	0			Wind, rain, hail, and tornado	Storm moved eastward in area from Kidder to Havana to Hillhead in Marshall County just north of Britton. Pictures taken after storm show corn badly stripped. Insurance agencies estimated 20 to 80 percent loss of crops. Several reports stated that funnel cloud appeared, but was not seen to touch ground.
Minnehaha County, S. Dak.	5	6:03-8:10 p.m.		25			*250,000		Wind, hail, and rain	Path of hailstorm was from 12 miles north of Sioux Falls east-southeastward. Rain of cloudburst pro- portion fell in south and east sections of Sioux Falls. Several thousand dollars' worth of flood damage occurred.
Boyden, Iowa	5	Evening						5,000	Hail	
Russell- ville, Ark.	5	7:30 p.m.					2,500		Wind	2 small planes destroyed and 1 damaged at airport.
Colony, Wyo.	5	9 p.m.	*1	10			5,000	20,000	Hail	Principal damage to growing crops.
Dixon Coun- ty, Nebr.	5	9-11:30 p.m.	*4 to 6	15 to 17			18,000	200,000	do	Average diameter, 1 inch; largest 2½ inches.
Dighton, Lane Coun- ty, Kans.	5	9:30 p.m.					2,500		Electri- cal	Lightning caused fire which destroyed barn and hay.
Linn County, Kans.	6	3 a.m.					3,000		do	Bolt of lightning killed 4 head of cattle and set fire to barn, burning it to ground southwest of Greenleaf.
Whiting, Jackson County (northeast- ern por- tion), Kans.	6	3:30 a.m.					4,000		do	Fire from lightning destroyed home and contents.
Hope, Ark.	6	4 a.m.							do	5 cows killed when lightning struck tree 9 miles south of Hope.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

AUGUST 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Carteret and Columbus Counties, N. C.	6	Early morning to late afternoon			1	1	\$5,000		Rain and electrical	Severe thunderstorms in southeast coastal area. Damage to telephone and power lines in Morehead City, where 3.5 inches of rain fell and very severe lightning occurred. Lightning killed man and injured woman, south of Whiteville.
Yakima, Mox- ee City, and Toppenish area, Yaki- ma County, Wash.	6	Late afternoon			1		2,000	\$5,000	Electrical and wind	Severe thunderstorm. High winds damaged hops. 1 person killed by lightning, and several forest fires started.
Gosper County, Nebr.	6	4-5 p.m.	*2				Little	Heavy	Hail	Major crops had been harvested. Largest stones 3 inches in diameter.
Dawson (near), Nebr.	6	4:30 p.m.	*1	5 to 6			Some	Considerable	do	Largest stones over 3 inches in diameter.
Phelps County (central portion), Nebr.	6	5 p.m.	*3	10			500	25,000	do	Average stones 1/4 inch in diameter, largest 1 1/2 to 2 inches.
Atchison County, Kans.	6	5:30-6:30 p.m.	*1 to 2	15		1	2,000	25,000	Hail and wind	Severe wind and hailstorm moving southeastward in Lancaster and surrounding area stripped corn and garden crops, broke windows, damaged roofs and small buildings, and uprooted trees. Boy's leg fractured by falling tree. Hailstones 1/2 to 3/4 inch in diameter. Property damage by wind; crop damage by hail.
Decatur County, Kans.	6	6-7 p.m.	*5	18				20,000	do	Hail, with stones mostly 1/2 to 1 inch in diameter, but with a few near golf ball size, damaged sorghums and corn southeast of Oberlin. In some localities hail was wind-driven.
Gosper County (south- ern portion), Nebr.	6	6-8 p.m.	*10				Considerable	Heavy	Hail	Crops defoliated; buildings and autos damaged. Largest stones 1 inch in diameter.
Hendley (near), Nebr.	6	7:30 p.m.	Nar- row	Short	0	0	0	0	Tornado	Path confined to open fields, crops mostly already harvested.
Bartley to Freedom, Nebr.	6	8 p.m.	*1 to 3	6 to 8			Little	Considerable	Hail	Stones marble to bantam egg size. Ground well covered in places.
Waterville (west of), Marshall County, Kans.	6	Night					1,000	1,200	Electrical	Fire started by lightning burned barn and granary with their contents of hay and grain.
Stanton County, Nebr.	6	9 p.m.	*2 to 4				Light	50,000	Hail	Average stones 1/2 inch in diameter.
Polk (north and east of), Nebr.	6	9:30- 10:30 p.m.	*2	8 to 10				20,000	do	Corn stripped. Average stones 1 inch and largest 2 inches in diameter.
Norton County, Kans.	6	9:30 p.m.	*1	8			10,000	15,000	do	Hailstorm moving from west damaged Norton and surrounding areas. Stones of 1/2 inch in diameter to golf ball size pounded greenhouses, neon signs, plate-glass windows, and truck gardens.
Bellevue, Iowa	6	10 p.m.					500		Electrical	Damaged power lines.
Council Bluffs, Iowa	6	Late evening					2,500		Electrical and rain	Damage to construction work.
Rooks and Ellis Counties, Kans.	6-7	11:40 p.m.- 12:30 a.m.	*4	18			60,000	55,000	Hail and wind	Wind and hail, with stones up to 2 inches in diameter, did extensive damage to eastern Ellis County and to northern Ellis and southern Rooks Counties from north of Hays to Plainville. Wind between Hays and Plainville snapped off 24 telephone poles, tore off roofs, and destroyed farm buildings. In Victoria and Vincent, hailstones up to 2 inches in diameter fell for 12 minutes, stripping trees, breaking windows and neon signs, and pounding garden crops into ground. Ground covered 2 to 6 inches and still littered with hailstones next morning. Property damage by wind, \$10,000; by hail, \$50,000. Crop damage by hail.
Georgetown, S. C.	7	2:30-3 a.m.	100	5	0	0	35,000		Tornado	Evidence pointed to tornadic action, although, due to lateness of hour, visible sign not reported. Movement of storm appeared to be westward.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

AUGUST 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Ness and Hodgeman Counties, Kans.	7	2:30-5 a.m.	*2 to 5	20			\$200	\$5,000	Hail	Hailstorm from 8 miles west of Ness City southeast- ward to 8 or 10 miles north of Jetmore broke windows in farm home and stripped leaves from trees, grain crops, and gardens. Stones up to size of hens' eggs.
Ford County, Kans.	7	6:45 a.m.					7,000		Electri- cal	Lightning set fire which burned frame building and contents of hatchery in Bucklin.
Anna-Cobden area, Union County, Ill.	7	Afternoon						100,000	Hail	About 125,000 bushels of peaches damaged.
Bureau, La Salle, Grundy, Will, and Livingston Counties, Ill.	7	2-6 p.m.					50,000	500,000	do	A large number of heavy hailstorms developed about same time at points in north-central and northeast. 1 area southeast of Mendota reported a strip 3 miles wide and 25 miles long covered ankle deep with hail. Near Morris, 500 acres of tomatoes ruined and between Elwood and Peotone, a large acreage of muskmelons beaten to pulp. Corn and soybeans stripped and flat- tened in thousands of acres.
McLean, Gray County, Tex.	7	P.m.					1,000		Wind and hail	Damaged buildings, trees, and shrubbery; crumpled barn; overturned truck; unroofed garage; snapped power lines. Some light hail.
Dale, Ind.	7	P.m.					8,000	50,000	do	Hail destroyed or damaged 900 acres of corn and soy- beans. Wind blew down barn and all outbuildings on 1 farm. About 85 percent of damage by hail; remain- der by wind.
Mason, Mich.	7	P.m.							Hail	Hail damaged 94 acres of cucumbers south of Mason.
Tucson, Ariz.	7	5:07 p.m.					11,000		Wind	High winds associated with squalls at leading edge of thunderstorm caused gusty conditions for about 4 min- utes, with 60 m.p.h. peak gusts at Tucson Airport. 2 airplanes broke moorings and were severely damaged. Other damage to hangar roofs, demolition of guard house, and roof damage to private home.
Etherton to Makanda, Jackson County, Ill.	7	5:30-5:40 p.m.	*1	10				150,000	Hail	Large hail hit fruit-growing area, causing major dam- age to peaches and apples. Minor damage to corn and soybeans.
Riggston, Morgan County, Ill.	7	Evening					500	500	do	Neon signs, automobiles, trees, corn, and soybeans, damaged.
Owensville, Mo.	7	6 p.m.					50,000	20,000	do	Damaged roofs, windows, and growing crops.
St. Louis, Mo.	7	6 p.m.					100,000		Hail and wind	Damage about evenly divided between hail and wind. A large number of trees blown down, damaging autos and buildings. Hail damage to roofs, windows, and signs. 300-foot radio tower broken in half.
Charlotte, Mich.	7	6:30-8:30 p.m.					14,000		Electri- cal	2 barns burned.
Columbia, S. C.	7	7-7:30 p.m.					1,000		do	Warehouse destroyed by fire from lightning.
Greer County (from Man- gum to northeast- ern part), Okla.	7	8-8:30 p.m.					7,500		Wind	Damage to a drive-in theatre; also minor damage in northeastern Greer County.
Cape Girar- deau, Mo.	7	8 p.m.					200,000	40,000	Hail and wind	Most damage from hail. Roofs, windows, and green- houses damaged. Crop damage to orchards, corn, soy- beans, and gardens. Some trees and television an- tennae blown down.
Crawfords- ville, Ind.	7	8 p.m.				3	10,000		Wind	Sudden squall wrecked small airplane as it took off, injuring 2 persons. Many electrical lines blown down, trees uprooted, etc.
Anderson, Ind.	7	9 p.m.					50,000		do	Wind uprooted trees and broke electrical lines in many sections of city.
Lyons and Muir, Mich.	7	9:30 p.m.					*8,000		Wind and hail	Several farm buildings destroyed.
Furnas Coun- ty (north- ern and southern portions), Nebr.	7	9:30 p.m.	*15				Light	3,000	do	Average stones 1 inch in diameter, largest 1½ inches.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

AUGUST 1951

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
From Cape Girardeau traffic bridge to Gale in Alexander County, Ill.	7	Night		8				\$100,000	Hail	Corn and soybeans in bottom lands stripped and flattened.
Millington (near), Mich.	8	6 a.m.					\$5,000		Electrical	Barn burned.
DeKalb, Etowah, and Marshall Counties, Ala.	8	Afternoon					5,000	2,000	Electrical, wind, and hail	Severe thunderstorms accompanied by high winds and hail caused considerable damage to homes, building and crops. Utility lines blown down; homes unroofed. Lightning struck 2 homes, resulting in fires, near Gadsden.
Alleghany, Davidson, and Macon Counties, N. C.	8	2-6 p.m.					5,200	5,000	Wind and hail	Scattered hail damage over 25 square miles of Macon and spots of other 2 Counties. Wind blew church off its foundation in Macon County.
Halifax, Va.	8	P.m.					Minor	200,000	Hail	Tobacco crops damaged or ruined.
Lynchburg, Va.	8	4:30-6 p.m.					36,500	5,500	Wind and hail	Severe thunderstorm damaged airplane at airport. Several small items of damage.
Glasgow (6 miles west of), Mont.	8	4:30-5 p.m.	*6	6			500	50,000	do	Property damage from wind.
Conrad, Mont.	8	4:45 p.m.	*2	20				Heavy	Hail	Damage to wheat and barley.
Canandaigua, N. Y.	8	4:45-4:47 p.m.				9	60,000		Wind	A thunderstorm squall struck Canandaigua fair ground toppling ferris wheel and flattening 38 of 41 tents
Canon City, Colo.	8	5:10-5:20 p.m.				2	1,500		Electrical	2 buildings burned. 2 persons injured near Royal Gorge Gate.
New Bloomfield area, Pa.	8	Evening							Rains	Heavy rains severely washed fields. 3 miles south of New Bloomfield, silt and debris were 6 inches deep on highway, delaying traffic. Fence lines washed out in some places.
Shippensburg, Pa.	8	7-7:45 p.m.			0	2	*35,000		Wind, hail, and tornado (possible)	Newspaper reports say funnel cloud was seen, but cooperative observer whose home was in path of storm and who was watching it approach did not see funnel. Winds with gusts estimated at 65 to 75 m.p.h. continued for about 45 minutes. All damage indicated uniform direction of blow. One-room school had front wall blown in and other 3 walls fell out as single units. 3 trailers demolished and 10 damaged; 2 buildings burned; 1 barn partly unroofed; scores of television antennae downed. Patches of corn, tomatoes, and peaches damaged by high winds and some hail. Utility lines downed by falling trees or branches. Storm damage confined to area 2 miles in radius centered at west end of Shippensburg.
Kit Carson, Colo.	8	8-8:15 p.m.	*3	7			10,000	15,000	Hail	Damage mostly in area to southwest of Kit Carson. Hailstones, size of marbles to somewhat larger, covered about 80 percent of ground.
Eufaula, McIntosh County, Okla.	8	8:30 p.m.				1	1,000		Electrical	Lightning struck 3 homes with minor damage to each. 1 person slightly injured.
Jackson, Hinds County, Miss.	8	9 p.m.			0	0	5,000	0	Tornado	Unroofed grandstand and a warehouse, damaged several other buildings, and disrupted power and light services in northeast Jackson.
Bouse, Ariz.	8	9 p.m.					5,000		Wind	High winds damaged several small buildings during thunderstorm.
Tallulah, Madison Parish, La.	8							1,000	do	Crops damaged in northeast section of Parish.
Pass Christian, Harrison County, Miss.	9	1:15 p.m.			0	0	3,500	0	Water-spout, rain, and hail	Damaged 2 homes and shrubbery. Rain and hail followed it.
Sherman County, Kans.	9	3 p.m.	*10	20			500	5,000	Hail	Hail, ranging up to size of golf balls, fell for 15 minutes from Goodland southeastward toward Edson. Lack of wind minimized damage.

See footnotes at end of table.

# SEVERE STORMS

Table 4-Continued

AUGUST 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Forsyth County, N. C.	9	3 p.m.						\$10,000	Hail	5 square miles damaged, mostly tobacco.
Pittsburgh area, Pa.	9	3-4 p.m.			1	1	Several thousand		Rain	Northern half of area hit by heavy rains with flash flood waters in some sections running 2 feet deep down streets, inundating basements and first floors of stores and homes. 250 picnickers stranded for several hours by high water near Harmarville. Drive-in theater had 4 feet of water over parking area. Riding academy had to evacuate its horses due to high water.
Erie (6 miles west of), Pa.	9	5 p.m.			0	0			Water- spout	Long well-developed cone seen hanging from a very black, turbulent-looking cloud base 4 miles out over Lake Erie, and coming directly to shore. At about 400 feet from Cowell's Beach, tip of cone estimated to be about 40 feet in diameter, touched Lake, with resulting up-spray of water.
Mercer and Burlington Counties, N. J.	9	P.m.				5	\$1,000	500	Wind and rain	5 persons injured in traffic accidents in Trenton area during peak of storm. Damage to trees and power and communications lines.
Hardin, Mont.	9	11 p.m.	*12 to 14	20- 25			Some	200,000	Hail	1,600 acres of sugar beets damaged, also wheat and oats.
Greeley County, Kans.	10	Afternoon				1			Electrical	Lightning knocked man from tractor 3 miles north of Tribune and left him stunned for about 10 minutes.
Lohn, McCulloch County, Tex.	10	5 p.m.	*3	6					Wind	Unroofed buildings; knocked church off foundation; demolished some small buildings.
Tennyson, Wyo.	10	5:15 p.m.			0	0	0	Light	Tornado	Funnel sighted, but due to fact that storm occurred over range country, only light damage resulted.
Kingman, Ariz.	10	5:30 p.m.					10,000		Hail and rain	Thunderstorm with heavy rain and hailstones up to 3/4-inch in diameter damaged many roofs and flooded some homes in low areas. Hail damage \$7,000; water damage \$3,000.
Grand Junction, Colo.	10	8-8:30 p.m.	*1 1/2	3/4				15,000	Hail	Storm centered on Orchard Mesa, southeast of Grand Junction. Hailstones ranged from size of peas to 1/2 inch in diameter, and accumulated to depth of 2 inches in spots.
Graham County, Kans.	10	9:15 p.m.					1,800	750	Electrical	Barn, struck by lightning, burned to ground near Hill City with 2 cows, 2,500 bales of hay, and other feed.
Pittsburgh, Pa.	11	Morning			6		Several hundred		Fog	5 automobiles and 2 trucks piled up in chain-reaction collision on fog-bound highway. Traffic tied up for miles in both directions as all 4 lanes blocked.
Albany County (north- ern por- tion), Wyo.	11	Afternoon					Light	20,000	Hail	Principal damage to wheat crop.
Jackson County, Okla.	11	3-7 p.m.					1,300		Wind	Damage mostly to barns and outbuildings on several farms in different parts of County.
Lexington (10 miles west of to 6 miles northeast of), Nebr.	11	3:30-4 p.m.	*2	16 to 20			5,000	45,000	Hail	Average stones 1/4 inch in diameter, largest 1 inch.
Lone Wolf area, Kiowa County, Okla.	11	4:55-7:10 p.m.	*1	5	0	0	12,700	5,800	Hail, tornado, wind, and electrical	Tornado struck farmstead 2 miles south of Lone Wolf, demolishing a barn and causing about \$3,500 damage; path narrow and short. Other damaging winds caused about \$1,200 loss. Hail in area 1 mile by 5 miles caused crop damage of \$5,800. Losses from lightning totaled \$8,000.
Knox City, Knox County, Tex.	11	5:45 p.m.			0	0		1,000	Tornado and hail	Heavy hail 1/2 to 3/4 inch in diameter beat cotton to ground. Some outhouses destroyed. Damage by hail \$900; by wind \$100.
Wichita Falls and subur- ban areas, Wichita and Clay Counties, Tex.	11	7 p.m.	*1	3	0	0	50,000		Tornado, wind, and hail	Moved northeastward. Several homes demolished; a number of barns partially destroyed; small buildings damaged or destroyed; roofs, signs, oil field derricks and tanks damaged.
Duncan area, Stephens County, Okla.	11	7:20 p.m.					40,000		Electrical	Lightning set fire to auction barn, with \$10,000 damage. Extensive damage by lightning to TV sets, air conditioners, and phone and power lines.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

AUGUST 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Stratford area, Gar- vin County, to south of Ada, Ponto- toc County, Okla.	11	8:30- 10:30 p.m.					\$8,000		Winds and electri- cal	Path southeastward. Home unroofed; wind damage to several barns and other buildings. Wind damage in Stratford area estimated at \$5,000. Lightning struck barn south of Ada and resulting fire destroyed building with hay and other contents.
Oklahoma City, Okla.	11	9-10 p.m.					8,000		Electri- cal	Violent electrical storm. Lightning struck main P.O. building with \$3,000 to \$5,000 loss at 9:20 p.m. 1 house set on fire. Electrical service disrupted.
Dryden area (north of Hollis), Harmon Coun- ty, Okla.	11-12	10 p.m.- 1 a.m.	*½	6			1,000	\$15,000	Hail and winds	Hail, 3/4 inch in diameter, caused damage to cotton estimated at \$15,000. Wind blew down garage and damaged roof, with loss estimated at \$1,000.
Chickasha (near), Grady Coun- ty, Okla.	11						14,600		Electri- cal	Lightning struck home setting it on fire, with loss of house, car, and garage.
McAlester, Pittsburg County, Okla.	11						15,000		do	Lightning struck garage.
Jay, Dela- ware Coun- ty, Okla.	11						10,000		do	Lightning struck community auction barn setting it afire; burned to ground.
St. Louis, Mo.	12	4 p.m.					1,200		do	Garage and contents destroyed by lightning.
Clarksville, Ark.	12	4:30-4:55 p.m.	1,760	4			*20,000		Wind and hail	Extensive damage to business and residential sections of city. Small hail covered ground to depth of ½ inch.
Mammoth Spring, Fulton Coun- ty, Ark.	13	A.m.							Electri- cal	7 head of cattle killed by lightning. 1 house destroyed by fire set by lightning.
New Hanover, Pender, On- slow, Jones, Carteret, Craven, Pamlico, Beaufort, Hyde, Dare, Tyrrell, Washington, Martin, Bertie, Chowan, Perquimans, Gates, Hertford, Pasquotank, Camden, and Currituck Counties, N. C.	13	Day and night			1	7	100,000	1,000,000	Hurricane	Crop damage is from estimates just received from county agents' reports. Actually, most crop damage due to corn blown down in fields, and amount of loss depends on weather between now and harvest time. Most property damage to beach cottages and warehouse roofs; much of it due to vulnerable construction. Death caused when man swept from pier at Wrightsville Beach and presumably drowned.
Swain and Yancey Counties, N. C.	13	2 p.m.						2,500	Wind	Windstorms in mountains, not connected with hurricane, blew down corn and tobacco crops.
Livingston (11 miles south of), Mont.	13	Afternoon			1	1			Electri- cal	One man killed and another injured by lightning.
Eastern Ot- tertail and western Wa- dena Coun- ties, Minn.	13	8:30 p.m.	*3	10			2,000	10,000	Hail, winds, and rain	Damage to growing crops and real property. Some hailstones as large as baseballs reported to have fallen near west end of Ottertail Lake, where ground almost covered in places. Storm moved from north-west. High winds and heavy rains accompanied storm.
Bovina, N.Y.	13	8:30 p.m.					*125,000		° Rain	Flash flood following heavy rain swept over Bovina area, flooding basements, washing out bridges and highways, and leaving stones and gravel in fields and lawns. Some pigs and calves drowned.
Roswell, N. Mex.	13						4,000		Wind	Hangar roof torn off and roofs on many homes damaged.

See footnotes at end of table.

# SEVERE STORMS

Table 4—Continued

AUGUST 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Virginia, eastern portion	13- 14								Hurricane	Boats loosened from moorings; signs blown over; utility lines down; roofs damaged. Most crop damage to corn which partially recovered.
Lake Linden, Mich.	14	3 a.m.					*\$1,000		Hail	Hail, size of crab apples, broke about 300 windows and damaged crops.
Mulliken, Mich.	14		*3	Sev- eral			*2,000		Hail and wind	Hail damaged buildings, destroyed crops, and accumulated to 6 inches in depth.
Delaware and eastern Maryland	14	A.m.-p.m.							Hurricane	Numerous boats loosened from moorings; signs blown over; utility lines down; roofs damaged. Most crop damage to corn which partially recovered.
New Jersey coastal area	14	Late a.m.- early p.m.					5,000	\$1,000	Wind and rain	Offshore hurricane caused little damage, although winds reached gale force along south and central coast, and 24-hour rainfall exceeded 8 inches in some cases.
Cheyenne, Wyo.	14	4:28 p.m.			0	0	0	0	Tornado	Pilot reported funnel cloud 20 miles north-northwest of Cheyenne. Funnel failed to reach ground and no damage reported.
Finney Coun- ty, Kans.	15	During day				1			Electri- cal	Man on tractor knocked unconscious and suffered burns on head and arms from stroke of lightning near Garden City.
Baytown, Harris Coun- ty, Tex.	15	2:50 p.m.	35		0	0	*4,000		Tornado and wind	Traveled northward. Small buildings damaged; signs and TV aerials blown down. Cars smashed by uprooted tree. Touched ground once and lifted into tree which it felled. Rice fields damaged by wind.
Muddy Gap, Wyo.	15	4 p.m.	*10	30			Light		Rain	Damage confined to shoulders of highways.
Colorado Springs, Colo.	15	4:30-8 p.m.					5,000	500	Rain, hail, and electri- cal	Power lines damaged; streets and basements flooded; lawns damaged and silt covered. Some streets and highways damaged.
Holyoke, Colo.	15-16								Rain, wind, and hail	A total of 4.85 inches of rain over weekend, accompanied by strong winds and light hail, caused heavy runoff, flooding streets, basements, and yards. Little damage caused by wind and hail.
Pueblo (near), Colo.	15-16		*8	15			100,000		Rain	Roads damaged and 3 bridges destroyed.
Leavenworth County (southern portion), Kans.	16	6:15 a.m.					7,000		Electri- cal	Fire from lightning destroyed 2 large barns, tractor, school bus, and some grain 5 miles west of Linwood.
Fayette- ville, Ark.	16	Noon-2 p.m.	440	**440			1,150	50	Wind and hail	Several houses and barns damaged by wind. Corn damaged by hail. Stones averaged ½ inch in diameter.
Ozark, Ark.	16	12:15- 2:30 p.m.					250		do	Slight wind damage to buildings. Hailstones ranged from 1/4 to 1/2 inch in diameter.
Eureka Springs, Ark.	16								Electri- cal	Fire set by lightning destroyed barn in which hay was stored.
Mobile, (South of), Ala.	16	Afternoon			0	0	0	0	Water- spouts	3 waterspouts observed near Alabama Port.
Jackson and Kiowa Coun- ties, Okla.	16	Afternoon					3,000		Winds	Strong gusty winds struck widely scattered sections of Jackson and Kiowa Counties, with minor damage to quite a number of buildings. In Lake Lugert area winds shortly after 4 p.m. caused much damage to State equipment and privately owned cabins. May have been a tornado, but not confirmed.
Nida Commu- nity, John- ston Coun- ty, Okla.	16	1:45 p.m.					1,500		do	Moved westward. Press reports called this a twister, but residents called it straight gusty wind. Blew down school bus shed; damaged several barns and chicken houses.
Cleveland, Lee, Warren, Scotland, and Madison Counties, N. C.	16	2-5 p.m.			1		500	57,000	Hail, and electri- cal	Near Kings Mountain, man killed by lightning as he sat under tree. A child he was holding reported unhurt. Scattered hail damage to tobacco in fields, mostly in Warren County.
Converse County (northern portion), Wyo.	16	2:30 p.m.	*2	5				Light	Hail	Storm occurred over range country and damage confined to range grass.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

AUGUST 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Warren County, Ky.	16	P.m.					\$40,000	\$3,000	Electrical and wind	Severe electrical storm, accompanied by high winds, struck Bowling Green and east-northeast section of County. Greatest damage caused by fires due to lightning. Wind gusts reaching 50 m.p.h. bowled over numerous large trees and television antennae. Wind damage \$5,000.
Fowler, Colo.	16	5-5:30 p.m.	*1½	6			10,000	90,000	Hail, rain, wind, and tornado	Hailstones size of marbles, and accumulated to depth of 1 inch over 80 percent of ground. From 1 to 3 inches of moisture damaged streets and roads, flooded basements, and disrupted telephone and electric services. A twister struck at a point 7 miles north of Fowler, damaging barn and several power poles.
Culpeper, Va.	16	7-11 p.m.					35,000		Electrical	Building with equipment and livestock burned.
Logan and vicinity, N. Mex.	16		*8	20			76,000	24,000	Hail and rain	Highways and railroads washed out. Basements flooded.
Sayre, Beckham County, Okla.	17	Afternoon			1				Electrical	Lightning killed man in Sayre.
Bennett (near), Colo.	17	2:30-3 p.m.	100	6	0	0			Tornado, rain, and hail	Storm area north and west of Bennett. Cloud, near perfect cylinder, and extended 1,000 feet into air. Forward movement about 7 or 8 m.p.h. Followed by heavy rain and a little hail. Storm path in uninhabited area and little damage resulted.
Franktown, Colo.	17	3-3:02 p.m.	100	2	0	0	18,000	2,000	Tornado	Storm of short duration and over limited area.
Broadus, Mont.	17	3:30-4:20 p.m.	*2	4			Some	Considerable	Hail	Damage to alfalfa, wheat, and gardens.
Orlando Airport, Fla.	17	3:32-3:35 p.m.			0	0	0	0	Tornado	Thin funnel cloud with slow irregular movement southwest of field; did not reach ground.
Fort Pierce, Fla.	17			Short	0	0	Slight	Slight	do	Small tornado struck about 10 miles west of Fort Pierce, causing slight damage to buildings and citrus trees.
Lower Marlboro, Md.	17	P.m.					Minor	0	Electrical	Tobacco barn burned.
Manassas, Va.	17	P.m.					Minor		do	Tobacco barn burned.
Paris (near), Lamar County, Tex.	17	6 p.m.			1				do	1 person killed by lightning during severe thunderstorm.
Sherman, Grayson County, Tex.	17	6 p.m.			1				do	1 person killed by lightning during severe thunderstorm.
Rock Springs, Mont.	17	7:30 p.m.	*1	40-50			Some	Considerable	Hail	75 to 85 percent damage mostly to wheat. Hailstones size of pigeon eggs.
Baker, Mont.	18	2 a.m.	*1½	2				4,000	do	Damage to wheat.
Belfield, N. Dak.	18	4:30-7 a.m.					30,000		Rains	Heavy rains, estimated from 3 to more than 5 inches, fell over area west of Belfield, causing flash floods on 2 creeks that converge on town of Belfield. Water 1½ to 3 feet deep rolled down main street. Houses washed away, many damaged; several business places damaged, especially basements; a bridge washed out; telephone and power lines damaged. Heavy rains occurred on following day, but no further flooding. Oldtimers said it was the worst flood since 1906.
Henderson County, N.C.	18	3 p.m.						5,000	Hail	Most damage to apples on trees.
Texarkana, Ark.	18	3:12 p.m.				1			Electrical	
Hay Springs (south and east of), Nebr.	18	4-5 p.m.	*3	10			3,000	7,500	Hail	Largest stones size of golf balls.
St. Martin (vicinity of), Minn.	18	6 p.m.			0	0			Tornado and rain	4 thin separate funnel-shaped clouds observed to develop just west of St. Martin, with 2 of the funnels descending almost vertically from common cloud base. Only 1 of the funnel formations observed to touch ground, destroying several acres of corn and lifting several yearling heifers into air and then

See footnotes at end of table.

# SEVERE STORMS

Table 4—Continued

AUGUST 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
St. Martin (vicinity of), Minn. (Cont'd.)	18									dropping them as tail of funnel ascended. The heifers, other than being bruised and shaken up, were not injured. Airplane pilot sighted a very small funnel development about 6 p.m. near Elrosa. Some heavy rain showers reported throughout area affected by tornado development. Storm moved eastward over narrow path. Time from observation of beginning of formation of funnel clouds to their dissipation was approximately 20 minutes.
Tucson Mountain Park, Ariz.	18	Evening					\$800		Wind	Roof ripped off large building approximately 3 miles east of headquarters of Tucson Mountain Park.
Spencer and vicinity, Ind.	18	10 p.m.					6,500	\$1,000	Wind, electrical, and hail	8 head of cattle killed by lightning. Hail in some communities as large as golf balls shredded corn and foliage and caused heavy damage in some melon patches. Trees blown down. 1 barn and several outbuildings destroyed. Damage about 13 percent by hail, 15 percent by lightning, and remainder by wind.
Sullivan's Island, S. C.	19	12:10- 12:15 p.m.			0	0			Water- spout and rain	Well-formed waterspout visible 1/8 mile northwest of station. Moved southwestward. Base about 100 feet in diameter. Spray visible 10 to 15 feet above water. Followed by copious rain.
Rye, Colo.	19	3-5 p.m.	*1	3				1,500	Hail	Hailstones ranged in size from small marbles to 1 inch in diameter. Damage mostly to growing crops.
Sterling, Colo.	19	4:15-4:30 p.m.	*3/4	8			20,000		do	Storm area extended from 1½ miles south of Sterling to 3 miles east of Atwood. Hailstones 1/4 to 1/2 inch in diameter, and accumulated to depth of ½ inch.
Libby (32 miles south- southeast of), Mont.	19	5:30-6 p.m.							High wind	40 to 50 m.p.h. wind blew down much timber.
Condon (near), Ore.	19	Evening					Little	Several thousand dollars	Hail	Very severe hailstorm over considerable area during wheat harvest; up to 90 percent loss of remaining wheat by shattering.
Alliance (northwest of), Nebr.	19	9:20 p.m.	*3	8			7,000	95,000	Hail and wind	Average stones ½ inch in diameter, largest 1½ inches. Some spots covered 6 inches deep.
Galata, Mont.	20	4 p.m.	*3	10				Consider- able	Hail	This storm moved eastward to Chester.
Great Falls, Mont.	20	5:27 p.m.		**25				10,000	do	
Chester, Mont.	20							Consider- able	do	
Estancia and vicinity, N. Mex.	20		*5	25				200,000	do	Some hailstones reported as large as small hens' eggs. Some damage to window glass and roofs.
Edroy, San Patricio County, Tex.	21	11:44 a.m.			0	0	0	0	Tornado	Tornado cloud reported by pilot about 5 miles north of Edroy. Apparently did not touch ground.
Mormon Lake, Ariz.	21	Afternoon				2			Electrical	2 children injured (not seriously) by lightning strike.
Chester area, Liberty County, Mont.	21	1 p.m.	*1 to 3	18- 20				600,000	Hail	
Palacios (15 miles south of), Mata- gorda County, Tex.	21	1:20 p.m.			0	0	0	0	Tornado	Pilot reported cloud about 15 miles south of Palacios. Did not touch ground.
Valier, Mont.	21	2 p.m.	*3	6				Consider- able	Hail	
Pendroy, Mont.	21	3:30 p.m.	*2	6				25,000	do	
Toole County (southeast ern corner), Mont.	21	5 p.m.						Consider- able	do	Up to 75 percent damage to some grain fields.
Fergus County, Mont.	21	5 p.m.	*1½	30				Light	do	Damage mostly to wheat.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

AUGUST 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
West Palm Beach, Fla.	21				0	0	\$0	\$0	Tornado	Funnel cloud west of airport; did not reach ground.
Tylertown, Walthall County, Miss.	22	A.m.-p.m.					5,000	1,000	Rains	Part of Tylertown and wide surrounding area inundated in early morning. Buildings, streets, and highway flooded. Town's water supply unsafe for a while.
Laurel-Bil- lings, Mont.	22	Evening	*1	3				Consider- able	Hail	
McKinley Park, Alaska	22						140,000		Rain	Heavy rain (1.42 inches) caused flood damage to Park Highway comparable to that which occurred in June. Numerous bridge approaches and culverts were lost and temporary river crossings at East Fork and Tokl Rivers made impassable.
Sheppard Field, Wi- chita Coun- ty, Tex.	24	1:06 p.m.			0	0	0	0	Tornado	Confirmed tornado observed 1½ miles north of station. Dissipated into cloud approximately 1½ miles north- west of station.
Great Falls, Mont.	24	1:27 p.m.	*15	30			6,000	21,000	Wind	Fastest mile 68 m.p.h., peak gusts 94 m.p.h.
Chouteau County, Mont.	24	2-3 p.m.					Some	Consider- able	do	Small grain damage by wind. Reported that in some fields 1 to 5 bushels of grain per acre shattered from heads.
Galata, Mont.	24	2:30 p.m.						Consider- able	Wind and hail	Several thousand dollars damage, due to shattering of grain. 5,000 bushels of wheat lost in one 800-acre field.
Liberty Coun- ty, Mont.	24	3 p.m.					150,000	400,000	do	Wind caused the property damage and \$150,000 of crop damage. Wind speed estimated at 100 m.p.h. About 100 buildings severely damaged or destroyed.
Trident, Mont.	24	Afternoon					Slight		Wind	Wind tore limbs from trees and tangled power and telephone lines.
Simpson, Mont.	24	3:30 p.m.					Some	Consider- able	do	20 to 65 percent damage to wheat. Strongest wind observed in area since 1917.
Chinook, Mont.	24	4-5 p.m.	*10	20				Light to heavy	do	
Turner, Mont.	24	4:45 p.m.	*4	12			3,000	125,000	Wind and hail	Hail pea size. Wind damage to property. \$50,000 of crop damage from wind.
Darby, Mont.	24						Some		Wind	Trees uprooted; power and telephone lines blown over.
Saco (Nelson Reservoir), Mont.	24						Some	Some	Wind and electrical	Lightning set fire to baled hay, and some hay in stacks. Some wind damage to crops.
Chatfield (vicinity of), Minn.	24	5:30 p.m.	880	6			1,000	40,000	Hail and winds	Moderate to heavy hail, that accompanied severe thunderstorm, caused considerable damage to growing crops and real property. Some hailstones reported to be almost as large as golf balls. Storm moved from southwest. Some fields of corn and soybeans almost total loss. High winds, that accompanied storm, caused some additional damage.
Winter (near), Wis.	24						5,000		Electrical	Lightning and fire destroyed barn.
West Palm Beach, Fla.	24				0	0	0	0	Tornado	Funnel cloud west of airport; did not reach ground.
Globe, Ariz.	25	1:30 p.m.	*20	50			3,100		Electrical and wind	Severe electrical storm and high winds. Wind damage \$1,000; lightning \$2,100.
Ray, Ariz.	25	6 p.m.					700		Wind	Thunderstorm with high winds unroofed 1 residence and damaged several other roofs.
Phoenix- Glendale area, Ariz.	25	7 p.m.	*1	5			35,900	10,100	Winds and rain	High winds, occasionally up to 60 m.p.h., damaged power lines and communication poles. Wind damage \$36,000. Heavy rain damaged newly-planted lettuce, necessitating replanting. Rain damage \$10,000.
Vancouver (17 miles north of), Wash.	26	4:30 p.m.	125	1			500	500	Wind (pos- sible tornado)	Very strong wind 2 miles south of Richfield community, described by residents of area as possibly a small tornado, demolished chicken house, blew windows out of residence, and leveled corn field.
Peach Spring, Ariz.	26	7:30 p.m.					4,000		Rain	Heavy rain, accompanying thunderstorm, caused breaching of earth dam, with resulting damage to installations below reservoir.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

AUGUST 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Plymouth, N. H.	26				1				Electri- cal	Woman killed by lightning while abed in tourist cabin.
Litchfield (near), Ariz.	27	1:03 p.m.	*2				\$8,000		Winds	Strong winds, accompanying thunderstorm, caused dam- age to power and communication lines about 8 miles west of Litchfield. Haybarn blown down at Good- year Farms.
Tucson, Ariz.	27	2 p.m.					12,000		do	High winds, connected with thunderstorm, unroofed dwelling, collapsing 1 wall; 2 walls of building un- der construction blown down.
Clearwater, Fla.	27				1	1			Electri- cal	Lightning killed 1 man and injured another.
Fort Myers, Fla.	27						1,000		do	Damage due to fire started by lightning.
Valley Coun- ty (south- eastern corner), Mont.	28	12:15-3 a.m.	*1	5				\$110,000	Hail	
Elmer and Toivola Townships, St. Louis Coun- ty, Minn.	28	A.m. and p.m.			1				Electri- cal	Man killed. Damages to barn and telephone lines. Heavy to excessive rains accompanied storm in northern counties.
Broadus, Mont.	28	3:30 p.m.	*2	20				2,000	Hail	Considerable damage to seed alfalfa.
Park County (northern half), Mont.	28	4:30-8:30 p.m.	*1½	20				40,000	do	Damage to wheat and barley.
Clyde Park (west of), Mont.	28	5 p.m.	880	10				30,000	do	Damage to wheat, barley, and oats.
Volborg (west of), Mont.	28	8:30 p.m.	*2	10				Consider- able	do	75 to 90 percent damage to late wheat and seed al- falfa.
Sykeston, N. Dak.	29						2,500		Electri- cal	Lightning struck barn, burning it to ground. Also struck and killed 2 head of cattle.
Corpus Chris- ti, Tex.	30				0	0	0	0	Tornado and wa- terspout	Weak tornado and waterspout observed ¼ mile south of Corpus Christi by Weather Bureau Airport Station.
Union City, Mich.	31	3:30 p.m.					8,000		Electri- cal and wind	Barn burned. Wind blew down trees.
Burlington, Mich.	31	5 p.m.					9,000		Electri- cal	Barn burned.
Agua Dulce, Nueces County, Tex.	31	8:25 p.m.			0	0	Minor	Minor	Tornado	Tornado reported 8 miles south of Agua Dulce.
Junction, Kimble County, Tex.	31	8:55 p.m.			0	0	0	0	do	Tornado near Junction struck on open ranch land for 2 miles. Confirmed by Highway Department.
Area adja- cent to Campbell- Walworth County line	31	9-11:15 p.m.	440	9			45,000	1,500	Wind and hail	Destruction of property at 1 farm about 15 miles southwest of Eureka indicates that tornado propor- tion winds occurred. A barn, several hog and chicken houses, garages, and windmills as well as haystacks completely destroyed. At other farms, a silo, roofs of barns, and haystacks destroyed. Hail of marble size caused minor damage to crops along west to east path.

\* Miles instead of yards.

\*\* Yards instead of miles.

o Crop damage included with other property damage.



# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

## AUGUST 1953

There were no major floods during August. Flash floods were reported at scattered locations throughout the Country. The Bogue Chitto River reached a record high crest for August at Franklinton, La. The local flood in the Belfield, N. Dak., Area was the worst since 1906. Several record low stages were reported.

**EAST GULF OF MEXICO.**—The heavy rains on the 21st and 22d caused the highest August flood crest on record for the Bogue Chitto River at Franklinton, La. The rains began about 3 p.m. on the 21st and ended around noon on the 22d. The heavy rains were concentrated over the middle reach of the Bogue Chitto Basin in Mississippi and Louisiana. The greatest bulk of the rainfall occurred during the early morning hours of the 22d. High water flowed into downtown Tylertown in and along the bed of Dry Creek at about 6:30 a.m., resulting in considerable damage in that area. These crests combined to provide the high record August crest at Franklinton. Subsequently the crest moved over the lower reaches of the Bogue Chitto and into the lower Pearl River Swamp producing a crest of 2.5 feet above flood stage at Pearl River, La.; while at and above Bogalusa, La., the Pearl River remained well within its banks.

The Alabama River at Millers Ferry, Ala., reported a record low August crest of 4.1 feet on the 27th. This was the lowest August stage since August 7, 1931, when a low stage of 5.0 feet was recorded. It, however, did not reach the record low stage of 3.0 feet recorded on Oct. 23, 1941.

**Upper Mississippi Basin.**—The Mississippi River was in flood at Aitkin, Minn., from Aug. 5 to 23d. The overflow was caused by heavy daily rainfall over this Basin during the first week of the month. No flooding occurred at Fort Ripley, Minn., forty-five miles downstream. A possible explanation of this fact may have been the impounding of flood waters by all the sloughs, marshes, and lowlands along the river and the very slow drainage back into the main stem. The resultant damages were confined principally to growing crops as approximately 22,000 acres of hay, small grains, and pastures were flooded.

Flash floods occurred in the Upper Iowa, Root and Zumbro Rivers in Iowa and Minn., on the 4th and 5th. Flooding occurred in the same areas in July. The Root River flood was more severe in the middle and upper portion than in July especially near Rushford, Minn., where considerable property damage was reported from the heavy flow from Rush Creek which empties into the Root River at this point. Several highways were closed to traffic in the Zumbro and Whitewater River Valleys.

Flash rises occurred on the Turkey River at Garber, Iowa, and on the Wapsipinicon River at and above Independence, Iowa, from the heavy rains between the 3d and 5th. The Turkey River rose almost 11 feet in 24 hours or less, flooding farmlands and causing heavy losses to growing field crops and to pastures. The flood losses in the Wapsipinicon Valley were considerably more.

The Red Cedar River at Charles City, Iowa, rose to a stage of 14.8 feet on the 4th. Only minor damages resulted.

**Missouri Basin.**—Heavy rains of from 1 to 3 inches on the 18th in the Fryburg-Belfield Area

in southwestern North Dakota caused flood waters to pour down two creeks which meet virtually on Belfield's main street. Water 1-1/2 to 3 feet deep rolled down main street, flooding basements and stores. A small house was ripped from its foundation and swept 200 yards downstream where it tore out a bridge before jamming to a halt. The basement of another home was caved in by flood waters. It was the worst flood in Belfield since 1906. Telephone and electric service was interrupted by the flood. The water drained into the Heart River which was bankfull but did not overflow.

The Kansas River at Wamego, Kans., reached a record low stage of -0.1 foot on the 29th. The previous low stage at this point was 0.3 foot in October and November 1952. The Republican River reached a record low stage of 0.98 foot at Concordia, Kans., on the 31st. The previous low stage at this point was 2.0 feet on Sept. 26-27, 1945.

**Ohio Basin.**—Exceptionally dry weather after the 10th of the month caused the Scioto River to reach a record low stage of -0.3 foot at Piketon, Ohio, on the 30th and 31st and approach within 0.1 of a foot of the lowest of record at Circleville, Ohio.

**Arkansas Basin.**—The heavy rains on the 3d and 4th caused some flooding on the Arkansas River at Hutchinson, Kans., between the 3d and 6th. This was the highest stage reached on the Arkansas at Hutchinson and Great Bend, Kans., since July 1951.

Flash floods were reported on local creeks in the Hoisington, Kans., vicinity on the 3d. The American Red Cross reported that three persons were injured and several homes and buildings were damaged in the flash floods.

**WEST GULF OF MEXICO DRAINAGE.**—Unusually heavy rains in Texas on the 18th brought flood conditions to much of the Texas Coastal Area. The rains continued through the end of the month. The major portion of Robstown, Tex., was inundated when the floodwaters broke through the drainage ditch dike. The towns of Kingsville, Alice, Falfurrias, Bishop, and Sinton were partially flooded. Over 2,300 families were forced to evacuate their homes.

Rainfall amounts at Corpus Christi was 12.64 inches which was a record for the month; heavier amounts were reported by the nearby counties with amounts ranging up to 20 inches. Considerable damage resulted to streets and highways in Corpus Christi from the flooding.

Heavy rains of 4 to 5 inches fell over the lower portions of the Lavaca and Navidad Rivers on August 28-30 causing major rises in both rivers. The Lavaca rose to within 2 feet of flood stage on the 31st and the Navidad was in moderate flood at Ganada, Tex., on the 31st. Very little damage resulted as the flooded areas were grazing lands.

Fairly general showers occurred over the Rio Grande Valley between the 17th and the close of the month. The total rainfall during the period ranged from 4.5 inches in the vicinity of Brownsville to a high of 24-28 inches in the area from north of Los Fresnos to Rio Hondo. The general average for the Valley will run near 6 inches. The heaviest rains causing all the runoff in the Rio Grande apparently fell in the Mexican part

# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS—Continued

AUGUST 1953

of the Basin. The Rio Alamo was in flood most of the period. The Rio San Juan was in flood but the Marte Gomes Reservoir was empty at the start. It filled by the 28th, then the spill caused an

abrupt rise on the 29th at Rio Grande City. The Rio Salada was in partial flood above Falcon Reservoir; the Don Martin Reservoir held a major portion of the flow upstream.

## FLOOD STAGE DATA

(All dates in August unless otherwise specified)

Table 5

AUGUST 1953

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
EAST GULF OF MEXICO DRAINAGE					
Bogue Chitto: Franklin, La.	11.0	22	24	17.6	23
Pearl: Pearl River, La.	12.0	25	28	14.5	27
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Zumbro:					
Zumbro Falls, Minn.	12**	1	5	17.4	4
Theilman, Minn.	38	4	5	39.4	4
Root:					
Houston, Minn.	15	4	4	15.1	4
Hokah, Minn.	48	4	5	49.0	4

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM (Cont'd.) <u>Upper Mississippi Basin (Cont'd.)</u>	<i>Fl</i>			<i>Fl</i>	
Upper Iowa: Dorchester, Iowa	12	2	7	17.5	4
Red Cedar: Charles City, Iowa	8.0**	3	5	14.8	4
Mississippi: Libby, Minn.	13	6	7	13.5	6
Aitkin, Minn.	12	5	23	15.1	14
WEST GULF OF MEXICO DRAINAGE					
Navidad: Canada, Tex.	21	31	31	27.2	31

\* Provisional

\*\* Tentative flood stage



# RADIOSONDE DATA

Average monthly values

Table 20

AUGUST 1953

ALBUQUERQUE, N. MEX. ( 840 MB. )				ATLANTA, GA. ( 983 MB. )				BIG SPRING, TEX. ( 926 MB. )				BISMARCK, N. DAK. ( 955 MB. )				BOISE, IDAHO ( 913 MB. )				BROWNSVILLE, TEX. (1013 MB. )				BUFFALO, N. Y. ( 992 MB. )				
Standard pressure surface (mb.)	Number of observations			Relative humidity	Number of observations			Relative humidity	Number of observations			Relative humidity	Number of observations			Relative humidity	Number of observations			Relative humidity	Number of observations			Relative humidity				
	Dynamic height	Temperature			Dynamic height	Temperature			Dynamic height	Temperature			Dynamic height	Temperature			Dynamic height	Temperature			Dynamic height	Temperature			Dynamic height	Temperature		
SURFACE	30	1,619	25.2	38	31	309	24.5	71	31	784	27.9	46	31	505	21.5	67	31	868	24.2	37	31	7	27.8	81	31	221	19.7	76
1,000----	30	49			31	155			31	91			31	98			31	56			31	123	27.2	80	31	149		
950----	30	518			31	611	24.8	57	31	554			31	551	22.1	59	31	516			31	581	24.3	75	31	597	20.4	58
900----	30	1,006			31	1,081	21.3	62	31	1,035	27.2	44	31	1,019	21.5	51	31	991	26.0	26	31	1,050	22.1	64	31	1,058	17.3	61
850----	30	1,513			31	1,573	17.3	68	31	1,538	23.5	47	31	1,512	17.9	55	31	1,491	22.9	24	31	1,545	19.5	56	31	1,544	13.7	64
800----	30	2,047	22.9	33	31	2,089	13.9	66	31	2,064	19.3	53	31	2,029	14.8	51	31	2,014	18.4	28	31	2,065	16.6	55	31	2,052	10.4	60
750----	30	2,606	18.5	36	31	2,636	10.5	61	31	2,620	15.1	56	31	2,579	11.2	53	31	2,565	13.7	32	31	2,615	13.4	52	31	2,593	7.1	56
700----	30	3,191	13.4	43	31	3,203	7.3	52	31	3,197	10.7	59	31	3,144	7.5	48	31	3,139	9.1	35	31	3,189	9.8	52	31	3,152	4.6	42
650----	30	3,813	8.2	53	31	3,818	4.1	45	31	3,818	6.1	61	31	3,756	3.2	49	31	3,754	4.0	38	31	3,804	5.9	53	31	3,756	1.6	38
600----	30	4,465	2.7	63	31	4,457	-9	38	31	4,462	1.9	56	31	4,393	-1.1	44	31	4,392	-1.1	42	31	4,452	2.0	52	30	4,395	-2.0	36
550----	30	5,162	-2.6	65	31	5,155	-3.1	32	31	5,160	-2.5	47	31	5,085	-5.5	39	31	5,082	-6.3	44	31	5,151	-2.1	49	30	5,081	-6.2	36
500----	29	5,912	-7.5	56	31	5,900	-7.4		30	5,910	-6.3	40	31	5,823	-10.4	34	30	5,823	-11.5	42	30	5,901	-6.7	47	30	5,821	-10.8	
450----	29	6,736	-12.0	40	31	6,726	-12.6		29	6,741	-10.9		29	6,636	-15.9		30	6,631	-17.2		30	6,722	-17.7	46	30	6,630	-16.1	
400----	29	7,618	-18.1		30	7,603	-18.5		29	7,625	-17.5		28	7,503	-22.3		29	7,493	-23.5		30	7,611	-17.4	44	30	7,501	-22.3	
350----	29	8,601	-25.2		29	8,584	-25.5		29	8,610	-24.5		28	8,470	-29.9		29	8,455	-31.1		30	8,595	-24.6	40	30	8,467	-29.8	
300----	29	9,701	-33.9		29	9,683	-33.7		29	9,714	-32.6		28	9,549	-38.2		29	9,529	-39.6		30	9,696	-33.2		29	9,549	-37.8	
250----	29	10,953	-43.3		29	10,935	-43.3		29	10,971	-42.3		28	10,781	-47.0		29	10,752	-48.1		30	10,948	-43.5		28	10,783	-46.8	
200----	29	12,420	-53.5		29	12,401	-54.2		29	12,444	-52.8		27	12,234	-57.5		29	12,203	-58.3		30	12,407	-55.8		28	12,234	-54.5	
175----	29	13,268	-58.8		28	13,242	-58.9		28	13,294	-58.0		27	13,091	-61.8		29	13,061	-64.1		30	13,244	-61.8		28	13,083	-56.7	
150----	29	14,223	-63.9		28	14,199	-63.9		28	14,244	-62.9		27	14,071	-67.2		29	14,048	-67.3		30	14,223	-67.3		28	14,055	-58.3	
125----	28	15,329	-67.8		28	15,310	-66.8		27	15,363	-67.0		27	15,216	-69.7		29	15,205	-69.7		30	15,329	-67.8		27	15,198	-60.4	
100----	27	16,666	-68.3		25	16,651	-66.6		23	16,702	-68.2		27	16,606	-69.0		29	16,605	-69.4		30	16,666	-68.3		25	16,589	-60.3	
80----	25	18,011	-65.8		24	18,005	-64.3		19	18,048	-65.6		26	18,002	-58.1		28	18,007	-58.3		28	18,011	-65.8		25	17,982	-58.9	
60----	21	19,786	-59.0		22	19,785	-59.2		18	19,826	-59.4		25	19,822	-54.8		28	19,831	-55.0		30	19,786	-59.0		24	19,800	-55.7	
50----	21	20,935	-56.9		20	20,937	-57.0		17	20,972	-56.9		24	20,991	-53.6		26	21,001	-53.2		28	20,935	-56.9		24	20,965	-53.7	
40----	15	22,352	-54.1		13	22,354	-54.5		9	22,381	-54.5		20	22,436	-51.2		16	22,440	-51.8		14	22,352	-54.1		23	22,404	-51.6	
30----	9	24,200	-50.8		6	24,220	-51.5						10	24,275	-49.9		6	24,322	-49.9		7	24,051	-53.2		15	24,267	-49.8	
20----																									10	26,908	-47.7	

BURRWOOD, LA. (1015 MB.)				CARIBOU, ME. ( 992 MB. )				CHARLESTON, S. C. (1016 MB.)				COLUMBIA, MO. ( 989 MB. )				DODGE CITY, KANS. ( 926 MB. )				EL PASO, TEX. ( 882 MB. )				ELY, NEV. ( 810 MB. )				
Standard pressure surface (mb.)	Number of observations			Relative humidity	Number of observations			Relative humidity	Number of observations			Relative humidity	Number of observations			Relative humidity	Number of observations			Relative humidity	Number of observations			Relative humidity				
	Dynamic height	Temperature			Dynamic height	Temperature			Dynamic height	Temperature			Dynamic height	Temperature			Dynamic height	Temperature			Dynamic height	Temperature			Dynamic height	Temperature		
SURFACE	31	3	27.3	82	31	191	14.5	81	31	13	23.5	91	31	238	24.2	56	31	792	24.5	55	31	1,195	28.6	35	31	1,908	19.8	29
1,000----	31	139	26.8	78	31	122			31	152	25.0	82	31	139			31	109			31	55			31	36		
950----	31	597	24.0	75	31	563	16.1	66	31	608	23.5	69	31	595	25.5	46	31	564			31	529			31	504		
900----	31	1,063	21.3	71	31	1,017	13.3	67	31	1,074	21.0	61	31	1,066	21.9	51	31	1,041	24.4	52	31	1,017			31	985		
850----	31	1,557	18.4	68	31	1,495	9.9	71	31	1,567	18.0	59	31	1,559	17.9	56	31	1,540	21.2	55	31	1,520	27.2	29	31	1,484		
800----	31	2,075	15.5	64	31	1,996	6.3	72	31	2,084	14.9	59	31	2,075	14.5	52	31	2,062	17.5	59	31	2,051	22.9	34	31	2,015	23.0	22
750----	31	2,624	12.5	60	31	2,532	3.4	66	31	2,634	11.5	61	31	2,623	10.9	52	31	2,611	13.8	58	31	2,612	17.7	41	31	2,574	18.9	89
700----	31	3,196	9.1	58	31	3,080	-7	56	31	3,201	8.0	58	31	3,190	7.4	49	31	3,188	9.8	57	31	3,191	12.6	49	31	3,159	13.8	24
650----	31	3,811	5.5	56	30	3,675	-2.6	50	31	3,818	4.4	57	31	3,804	4.2	37	31	3,806	5.7	50	31	3,812	7.3	53	31	3,781	8.0	30
600----	31	4,457	1.7	53	30	4,301	-6.0	41	31	4,458	1.0	49	31	4,444	-6	29	31	4,450	1.4	49	31	4,460	2.2	55	31	4,431	2.0	36
550----	31	5,159	-2.3	51	30	4,980	-10.1	35	31	5,158	-2.8	45	31	5,136	-3.7		30	5,149	-3.0	49	31	5,162	-2.7	55	31	5,126	-4.1	43
500----	31	5,905	-6.7	45	30	5,705	-14.8	33	31	5,903	-7.0	35	31	5,884	-8.6		30	5,895	-7.9	43	31	5,905	-7.1	46	31	5,870	-9.5	42
450----	30	6,731	-11.9	44	30	6,501	-20.1		31	6,731	-12.1		30	6,699	-14.2		30	6,717	-13.2		30	6,731	-11.8	34	31	6,685	-14.9	34
400----	30	7,612	-17.7	48	30	7,358	-26.1		31	7,608	-18.1	37	30	7,573	-20.8		30	7,593	-19.5		30	7,612	-17.6		31	7,558	-21.0	
350----	30	8,597	-24.6	45	30	8,309	-33.2		31	8,591	-25.1	37	30	8,545	-27.8		30	8,571	-26.3		30	8,595	-24.7		31	8,530	-28.3	
300----	30	9,700	-32.8	41	30	9,374	-40.4		31	9,691	-33.8	40	30	9,634	-36.0		30	9,665	-34.8		30	9,696	-33.1		31	9,616	-36.7	
250----	30	10,955	-42.9		30	10,597	-46.7		31	10,942	-44.0		30	10,874	-45.1		30	10,911	-44.1		29	10,948</						

# RADIOSONDE DATA

Average monthly values

AUGUST 1953

Table 20--Continued

INTERNAT. FALLS, MINN. ( 973 MB.)				LAKE CHARLES, LA. (1015 MB.)				LANDER, WYO. ( 830 MB.)				LAS VEGAS, NEV. ( 933 MB.)				LITTLE ROCK, ARK. (1007 MB.)				MAZATLAN, MEXICO (1008 MB.)				MEDFORD, ORE. ( 967 MB.)				
Standard pressure surface (mb.)																												
Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				
Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				
Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				
Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				
SURFACE	31	360	18.0	84	31	5	25.9	88	31	1,696	21.4	36	31	660	32.7	16	31	79	25.9	69	28	14	29.8	75	31	401	23.7	47
1,000--	31	120			31	135	26.4	80	31	45			31	31			31	139	27.0	64	28	89	29.1	76	31	105		
950----	31	566	20.2	68	31	591	24.2	75	31	510			31	504			31	595	25.5	57	28	550	26.0	74	31	564	23.2	45
900----	31	1,029	17.6	65	31	1,060	21.4	74	31	990			31	987	32.0	18	31	1,068	22.0	62	28	1,023	23.3	75	31	1,024	19.6	49
850----	31	1,516	14.3	69	31	1,554	18.5	71	31	1,491			31	1,496	27.7	21	31	1,562	18.6	64	28	1,521	20.5	72	31	1,513	15.6	57
800----	31	2,025	10.9	66	31	2,072	15.6	64	31	2,019	21.6	31	31	2,028	22.9	24	31	2,080	15.4	60	28	2,043	17.6	70	31	2,024	11.7	63
750----	31	2,566	8.3	55	31	2,626	12.6	58	31	2,577	17.1	36	31	2,585	17.8	28	31	2,630	12.4	56	28	2,597	14.6	67	31	2,569	8.0	63
700----	31	3,128	5.2	47	31	3,194	9.0	56	31	3,157	12.0	42	31	3,168	12.5	33	31	3,201	9.1	54	28	3,174	11.1	66	31	3,127	4.4	62
650----	28	3,735	1.7	38	31	3,809	5.2	53	31	3,777	6.7	49	31	3,787	7.2	38	31	3,818	5.4	49	28	3,791	6.9	72	31	3,730		55
600----	28	4,370	-2.3	36	31	4,454	1.4	52	31	4,423	1.3	55	31	4,437	-2.2	37	31	4,462	1.6	45	26	4,445	2.3	73	31	4,364	-3.4	48
550----	28	5,055	-6.7	35	31	5,152	-2.5	47	31	5,116	-4.2	60	31	5,132	-2.6		31	5,163	-2.4	40	26	5,145	-2.2	76	31	5,048	-7.6	41
500----	28	5,793	-11.4		31	5,900	-6.9	43	31	5,861	-8.9	54	31	5,883	-8.0		31	5,910	-6.6	34	26	5,894	-6.5	73	31	5,782	-12.8	38
450----	28	6,603	-17.2		31	6,724	-12.2		31	6,677	-14.1	42	31	6,703	-13.3		31	6,739	-11.8	31	25	6,715	-11.3	63	31	6,587	-18.2	37
400----	28	7,465	-23.7		31	7,605	-18.1	44	31	7,552	-20.2		31	7,581	-19.4		31	7,619	-17.7	35	25	7,607	-16.5	60	31	7,447	-24.4	
350----	28	8,425	-31.1		31	8,588	-25.0	44	31	8,526	-27.8		31	8,557	-27.0		30	8,603	-24.7		25	8,596	-23.2	58	31	8,405	-31.7	
300----	27	9,501	-39.2		30	9,689	-33.3	41	30	9,617	-36.3	39	30	9,649	-35.5		29	9,708	-33.2		25	9,705	-31.5		31	9,477	-39.8	
250----	27	10,724	-48.0		30	10,941	-43.1		30	10,855	-45.0		29	10,889	-44.6		28	10,963	-42.9		21	10,968	-41.5		31	10,699	-48.1	
200----	27	12,171	-53.5		29	12,405	-54.7		30	12,320	-51.5		29	12,354	-52.7		28	12,435	-52.6		17	12,438	-53.8		31	12,151	-52.6	
175----	27	13,029	-54.0		29	13,248	-59.9		30	13,181	-58.0		29	13,207	-57.1		28	13,288	-57.2		14	13,285	-60.2		31	13,011	-53.4	
150----	27	14,013	-55.7		29	14,196	-64.5		29	14,162	-57.1		28	14,167	-62.2		28	14,251	-62.2		7	14,232	-67.1		31	14,001	-54.4	
125----	27	15,168	-57.6		29	15,299	-68.5		29	15,308	-59.8		26	15,280	-65.9		28	15,364	-66.8		31	15,364	-66.8		31	15,164	-56.4	
100----	26	16,572	-57.7		29	16,628	-70.0		26	16,696	-61.3		25	16,630	-66.5		27	16,705	-67.5		30	16,705	-67.5		30	16,576	-58.3	
80----	24	17,978	-56.3		26	17,963	-67.0		25	18,087	-58.0		24	17,987	-64.1		26	18,053	-65.0		30	17,980	-58.3		30	17,980	-58.3	
60----	22	19,812	-54.2		23	19,718	-61.3		21	19,914	-54.6		22	19,765	-58.5		26	19,830	-59.1		27	19,795	-56.2		24	19,795	-56.2	
50----	19	20,984	-52.7		18	20,856	-58.9		19	21,081	-52.9		20	20,919	-56.1		26	20,979	-56.5		24	20,964	-54.7		20	20,964	-54.7	
40----	15	22,440	-50.5		11	22,271	-55.2		14	22,525	-50.6		16	22,343	-53.7		16	22,401	-53.8		20	22,398	-52.7		11	22,398	-52.7	
30----	9	24,331	-46.1										11	24,207	-50.2		9	24,276	-51.1									

MERIDA, MEXICO (1012 MB.)				MIAMI, FLA. (1016 MB.)				NANTUCKET, MASS. (1015 MB.)				NASHVILLE, TENN. ( 997 MB.)				NORTH PLATTE, NEBR. ( 918 MB.)				OAKLAND, CALIF. (1014 MB.)				OKLAHOMA CITY, OKLA. ( 971 MB.)				
Standard pressure surface (mb.)																												
Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				Number of observations				
Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				Dynamic height				
Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				Temperature				
Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				Relative humidity				
SURFACE	31	27	27.0	80	31	4	27.6	77	31	14	17.5	92	31	177	24.6	69	30	848	22.7	63	31	6	16.5	82	31	391	25.1	72
1,000--	31	134	26.6	79	31	149	26.9	75	31	145	19.4	80	31	149			30	90			31	126	15.2	81	31	126		
950----	31	590	24.9	71	31	602	23.6	76	31	588	18.5	64	31	601	25.4	48	30	548			31	569	17.0	63	31	583	22.5	62
900----	31	1,061	22.0	71	31	1,072	20.7	71	31	1,048	15.6	63	31	1,075	21.8	52	30	1,020	23.5	54	31	1,025	18.5	40	31	1,055	22.8	59
850----	31	1,556	18.7	74	31	1,565	17.7	69	31	1,530	12.4	61	31	1,568	17.8	57	30	1,518	21.2	53	31	1,513	16.6	35	31	1,550	19.6	57
800----	31	2,074	15.6	72	31	2,081	14.6	67	31	2,037	9.9	58	31	2,083	14.0	56	30	2,041	17.6	59	31	2,026	14.4	28	31	2,070	16.0	59
750----	31	2,620	12.6	67	31	2,625	11.5	62	31	2,576	7.4	50	31	2,629	10.6	52	30	2,594	13.4	61	31	2,572	11.3		31	2,621	12.7	51
700----	31	3,198	9.7	55	31	3,198	8.4	53	31	3,137	4.7	43	31	3,196	7.3	44	30	3,166	9.2	60	31	3,140	8.0		31	3,191	9.1	49
650----	29	3,810	6.2	50	31	3,808	4.9	55	31	3,742	2.0		31	3,807	4.1	39	30	3,781	5.2	52	31	3,751	4.3		31	3,808	5.6	43
600----	27	4,460	2.4	50	31	4,456	1.1	53	31	4,380	-1.5		31	4,449	-3.6		30	4,425	9.4	48	31	4,393	-1.5		31	4,452	1.6	45
550----	26	5,163	-1.6	47	31	5,150	-2.8	44	31	5,070	-5.4		31	5,145	-3.4		29	5,120	-3.4	37	31	5,085	-4.5		31	5,151	-2.5	40
500----	26	5,912	-6.3	45	31	5,900	-7.2	40	30	5,809	-10.0		31	5,890	-8.1		29	5,867	-8.7	37	31	5,828	-9.3		31	5,898	-7.1	37
450----	26	6,737	-11.4	42	31	6,720	-12.2	46	30	6,623	-15.5		31	6,710	-13.3		30	6,685	-14.1		30	6,645	-15.1		30	6,724	-12.5	33
400----	26	7,623	-17.1	41	30	7,605	-18.1	46	30	7,492	-21.3		31	7,586	-19.3		28	7,558	-20.5		30	7,515	-21.9		30	7,600	-18.5	34
350----	26	8,610	-24.1	41	30	8,588	-24.9	49	30	8,462	-28.4		30	8,561	-26.5		28	8,531	-27.9		30	8,482	-29.6		30	8,581	-25.5	
300----	22	9,713	-32.4		29	9,689	-33.4	38	30	9,548	-36.5		30	9,655	-34.8		28	9,618	-36.2		28	9,561	-37.9		30	9,680	-33.7	
250----	18	10,972	-42.5		28	10,940	-43.7		30	10,787	-45.4		30	10,901	-43.2		28	10,855	-45.7		28	10,793	-46.3		30	10,932	-43.2	
200----	13	12,434	-55.0		28	12,398	-55.9		29	12,245	-54.2		30	12,366	-53.1		26	12,310	-54.6		27	12,246	-53.0		30	12,398	-53.6	
175----	12	13,072	-61.7		28	13,034	-62.3		29	13,094	-57.5		30	13,218	-57.6		26	13,157	-58.0		27	13,103	-54.9		30	13,246	-58.2	
150----	15	14,010	-68.0		28	14,172	-67.3		28	14,057	-59.8		30	14,180	-61.7		26	14,118	-61.8		27	14,079	-58.3		29	14,205	-63.0	
125----	7	15,299	-72.5		27	15,264	-69.9		28	15,190	-61.3		30	15,299	-65.4		25	15,234	-65.3		27	15,216	-61.6		27	15,314	-67.0	
100----					25	16,589	-70.1		27	16,573	-60.9		30	16,649	-66.4		26	16,584	-66.4		27	16,591	-62.7		25	16,657	-69.1	
80----	60				23	17,922	-66.8		25	17,962	-59.0		29	18,007	-63.2		22	17,948	-63.0									



# RADIOSONDE DATA

Average monthly values

Table 20--Continued

AUGUST 1953

Standard pressure surface (mb.)	SAN JOAN, P. R. (1015 MB.)				SANTA BARBARA, CALIF. (1006 MB.)				S. STE. MARIE, MICH. (991 MB.)				SPOKANE, WASH. (930 MB.)				SWAN ISLAND, W. I. (1013 MB.)				TACUBAYA, MEXICO (775 MB.)				TAMPA, FLA. (1016 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	19	26.6	81	31	71	14.5	85	31	221	16.3	85	31	722	23.0	38	31	10	27.4	83	31	2,306	16.4	74	31	7	25.2	86
1,000----	31	152	25.8	80	31	123	13.9	84	31	145			31	85			31	125	26.8	82	31	68			31	149	25.7	81
950-----	31	603	22.6	81	31	569	17.6	68	31	590	18.5	62	31	543			31	579	23.8	80	31	534			31	603	23.4	77
900-----	31	1,072	19.6	81	31	1,024	21.3	32	31	1,049	15.9	62	31	1,010	21.6	36	31	1,049	20.9	77	31	1,011			31	1,072	20.7	76
850-----	31	1,563	17.0	73	31	1,517	19.6	30	31	1,532	12.6	64	31	1,501	17.4	41	31	1,542	18.1	71	31	1,504			31	1,565	17.9	75
800-----	31	2,079	14.8	61	31	2,035	16.4	30	31	2,038	9.5	61	31	2,015	12.9	47	31	2,060	15.3	66	31	2,039			31	2,082	14.9	71
750-----	31	2,624	12.1	51	31	2,583	13.5	23	31	2,577	6.6	61	31	2,558	8.4	51	31	2,607	12.4	59	31	2,588	14.8	69	31	2,635	11.7	71
700-----	31	3,198	8.6	49	31	3,158	10.2		31	3,135	4.1	52	31	3,119	4.4	49	31	3,180	9.3	56	31	3,165	11.0	72	31	3,202	8.5	71
650-----	31	3,610	5.1	44	31	3,773	6.5		31	3,737		46	31	3,723		44	31	3,794	5.8	50	31	3,785	6.0	75	31	3,817	5.1	70
600-----	31	4,458	1.7	37	31	4,422	2.4		31	4,374	- 2.7	37	31	4,356	- 3.6	41	31	4,442	2.1	41	31	4,435	1.9	80	31	4,461	1.3	70
550-----	31	5,160	- 1.9	29	31	5,120	- 2.4		31	5,059	- 6.9	35	31	5,039	- 8.3	37	31	5,139	- 1.6	36	29	5,138	- 2.0	78	31	5,164	- 2.5	66
500-----	31	5,907	- 6.2		31	5,796	- 11.6	33	31	5,796	- 11.6	33	31	5,770	- 13.1	34	31	5,892	- 6.1	34	29	5,886	- 6.6	73	31	5,908	- 6.7	63
450-----	31	6,735	- 11.6		31	6,688	- 13.2		31	6,603	- 17.0	31	31	6,572	- 18.8	33	31	6,716	- 11.2	32	28	6,715	- 11.3	70	31	6,741	- 11.7	58
400-----	31	7,617	- 17.6		31	7,566	- 20.3		31	7,470	- 23.4		31	7,431	- 25.0	35	31	7,603	- 17.3	29	28	7,602	- 16.4	62	31	7,617	- 17.3	52
350-----	31	8,600	- 25.1		31	8,539	- 28.0		31	8,433	- 30.6		31	8,386	- 32.4	33	31	8,589	- 24.2		27	8,593	- 23.0	62	31	8,604	- 24.2	48
300-----	31	9,700	- 33.8		31	9,626	- 36.4		31	9,509	- 38.9		31	9,453	- 40.8		31	9,693	- 32.5		23	9,704	- 31.5	58	31	9,709	- 32.4	45
250-----	31	10,951	- 43.7		30	10,864	- 45.3		30	10,736	- 47.9		31	10,666	- 49.6		31	10,949	- 42.7		20	10,972	- 41.7		31	10,967	- 42.3	
200-----	31	12,412	- 55.5		30	12,325	- 53.4		29	12,177	- 54.4		31	12,109	- 53.1		31	12,414	- 54.9		16	12,446	- 54.1		31	12,436	- 54.4	
175-----	31	13,250	- 61.6		30	13,176	- 57.3		29	13,030	- 55.5		30	12,968	- 52.8		30	13,254	- 61.6		14	13,285	- 60.7		29	13,277	- 60.6	
150-----	31	14,193	- 66.1		30	14,138	- 62.1		27	13,998	- 56.3		30	13,962	- 53.0		30	14,192	- 68.4		11	14,227	- 67.1		28	14,224	- 65.4	
125-----	31	15,288	- 70.0		30	15,253	- 65.9		25	15,145	- 57.4		29	15,137	- 54.5		29	15,272	- 72.6		7	15,308	- 71.3		27	15,325	- 68.6	
100-----	29	16,601	- 73.1		29	16,603	- 65.6		21	16,560	- 58.6		29	16,559	- 55.8		26	16,575	- 73.7		5	16,609	- 73.9		26	16,655	- 69.8	
80-----	27	17,914	- 70.2		29	17,965	- 63.2		9	17,963	- 56.0		28	17,977	- 55.8		22	17,885	- 70.8						22	17,987	- 67.1	
60-----	25	19,645	- 63.7		29	19,755	- 58.0						28	19,816	- 54.0		21	19,614	- 65.0						20	19,742	- 62.0	
50-----	22	20,769	- 60.8		25	20,911	- 55.5						25	20,990	- 52.5		18	20,732	- 61.1						15	20,873	- 59.1	
40-----	18	22,163	- 57.6		21	22,334	- 53.3						24	22,436	- 51.0		16	22,132	- 57.4						13	22,284	- 56.7	
30-----	9	24,011	- 53.2		11	24,193	- 50.5						10	24,351	- 48.0		12	23,956	- 53.9						5	24,118	- 54.5	

Standard pressure surface (mb.)	TATOOSH ISLAND, WASH. (1013 MB.)				VERACRUZ, MEXICO (1011 MB.)				WASHINGTON, D. C. (1008 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	31	13.9	92	29	13	29.0	75	31	88	21.8	74
1,000----	31	137	14.2	87	29	107	28.2	76	31	155	23.6	67
950-----	31	573	14.0	75	29	559	24.4	78	31	608	22.4	62
900-----	31	1,026	12.3	69	29	1,035	21.9	67	31	1,072	19.2	65
850-----	31	1,503	9.8	68	29	1,530	18.9	66	31	1,561	15.8	68
800-----	31	2,005	7.1	65	29	2,048	15.6	64	31	2,074	12.1	73
750-----	31	2,540	4.1	63	29	2,597	12.2	65	31	2,617	8.8	70
700-----	31	3,091	1.1	61	29	3,169	8.8	64	31	3,180	5.7	59
650-----	31	3,689	- 2.1	58	23	3,782	5.3	61	31	3,789	2.6	51
600-----	31	4,316	- 5.8	54	20	4,432	1.4	64	31	4,428	- 2.0	40
550-----	31	4,993	- 10.1	49	20	5,125	- 2.3	55	31	5,121	- 4.0	36
500-----	31	5,720	- 15.0	48	20	5,879	- 6.6	57	31	5,865	- 8.8	
450-----	29	6,512	- 20.2	40	18	6,702	- 11.4		31	6,681	- 14.4	
400-----	29	7,367	- 26.5		15	7,592	- 17.6		31	7,556	- 20.3	
350-----	29	8,316	- 34.1		14	8,583	- 23.8		30	8,529	- 27.3	
300-----	29	9,375	- 42.5		12	9,690	- 32.4		30	9,619	- 35.6	
250-----	29	10,583	- 50.5		9	10,955	- 42.2		30	10,861	- 44.8	
200-----	29	12,026	- 51.9		9	12,423	- 54.5		30	12,320	- 54.3	
175-----	29	12,891	- 51.7		8	13,259	- 61.6		30	13,167	- 58.5	
150-----	29	13,890	- 51.6		6	14,199	- 68.0		30	14,127	- 61.6	
125-----	29	15,069	- 53.0		6	15,277	- 73.6		29	15,246	- 63.9	
100-----	26	16,507	- 54.3		5	16,608	- 73.6		26	16,606	- 63.6	
80-----	23	17,938	- 54.2						24	17,980	- 61.2	
60-----	16	19,789	- 53.6						23	19,779	- 57.7	
50-----	15	20,964	- 52.4						22	20,932	- 55.4	
40-----	10	22,407	- 51.0						21	22,360	- 53.2	
30-----	7	24,281	- 49.0						19	24,224	- 50.9	
20-----									9	26,894	- 47.3	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and

expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

## Average monthly resultant winds

AUGUST 1953

Rawin Data (Cont'd.)				* Rawin Data (Cont'd.)				** Rawin Data (Cont'd.)			
18 000 m.,	17 obs.,	55 dir.,	1.9 speed	18 000 m.,	28 obs.,	303 dir.,	4.9 speed	18 000 m.,	31 obs.,	284 dir.,	3.2 speed
20 000 m.,	15 obs.,	82 dir.,	7.9 speed	20 000 m.,	28 obs.,	326 dir.,	1.8 speed	20 000 m.,	30 obs.,	81 dir.,	2.6 speed
22 000 m.,	12 obs.,	83 dir.,	9.2 speed	22 000 m.,	21 obs.,	10 dir.,	2.0 speed	22 000 m.,	30 obs.,	73 dir.,	4.3 speed
24 000 m.,	11 obs.,	70 dir.,	9.5 speed	24 000 m.,	18 obs.,	117 dir.,	1.6 speed	24 000 m.,	29 obs.,	82 dir.,	8.4 speed
				26 000 m.,	17 obs.,	180 dir.,	1.8 speed	26 000 m.,	23 obs.,	79 dir.,	9.5 speed
				28 000 m.,	14 obs.,	90 dir.,	4.1 speed				

These free air resultant winds are based on pilot balloon observations made  $\bar{W} = 270^\circ$ ; speeds in meters per second, near 2100 G.C.T.; directions in degrees from north ( $N = 360^\circ$ ,  $E = 90^\circ$ ,  $S = 180^\circ$ ,



# RAWIN DATA Average monthly resultant winds

Table 22

AUGUST 1953

Altitude (meters) m s l	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrowswood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			Int. Falls Minn. (358 m.)			
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		
Surface-----	31	126	2.0	31	133	4.4	23	131	2.0	31	118	4.9	31	132	0.9	31	253	1.8	31	100	0.9	31	119	2.4	31	39	1.5	31	169	0.4	30	193	1.5	31	182	0.4	
500-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,500-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2,000-----	31	183	1.7	31	148	4.8	23	206	5.4	31	134	3.5	30	66	2.0	30	300	7.0	31	58	1.5	31	220	1.3	31	211	1.1	31	313	1.0	29	312	1.3	31	290	4.5	
2,500-----	31	260	1.8	31	135	2.8	23	232	5.1	31	124	2.2	29	65	1.4	30	296	8.8	31	23	7.7	31	243	1.8	31	242	2.5	31	334	2.0	30	288	1.6	30	292	4.7	
3,000-----	31	276	2.6	31	89	9.9	23	252	5.0	31	149	1.8	29	31	7.2	29	293	8.8	31	252	4.3	31	268	3.0	31	246	3.3	31	322	2.9	29	263	2.2	27	293	4.6	
4,000-----	31	295	3.4	31	24	3.4	23	263	6.8	31	175	1.8	30	291	5.2	28	292	9.6	31	230	1.6	31	303	2.8	31	251	4.7	31	288	2.4	29	257	3.8	25	298	5.8	
5,000-----	30	287	3.8	31	21	5.2	22	275	9.9	31	350	9.3	30	280	1.7	28	290	11.4	31	292	1.8	31	316	3.4	30	253	6.4	31	295	3.7	29	262	4.0	25	297	7.5	
6,000-----	30	284	3.1	30	5	5.4	22	271	10.4	29	54	3.3	31	278	2.1	28	287	13.1	31	284	2.2	30	313	3.9	29	255	8.3	31	289	5.4	29	253	4.8	25	297	10.6	
8,000-----	30	269	5.1	30	355	3.8	20	262	13.7	28	26	1.7	30	298	1.4	28	284	17.6	30	261	6.1	27	304	6.8	26	249	11.5	31	271	9.0	29	257	8.9	23	302	14.5	
10,000-----	30	286	7.5	30	301	5.2	17	266	16.3	29	319	6.3	30	278	2.2	26	283	23.8	30	256	9.8	24	299	12.5	25	251	15.3	29	262	13.0	29	260	12.5	20	302	16.9	
12,000-----	29	255	9.2	28	313	5.3	19	258	20.8	28	309	1.4	30	282	2.2	16	294	18.7	31	253	12.8	22	305	12.9	21	249	15.9	25	254	16.3	29	261	15.9	15	298	21.2	
14,000-----	26	272	8.0	25	352	2.6	16	276	13.3	26	56	1.6	29	192	1.3	12	297	17.9	31	281	6.1	22	303	11.3	18	252	16.3	24	275	11.3	28	272	11.6	12	312	16.8	
16,000-----	24	250	3.9	22	102	1.5	15	269	8.6	18	79	4.2	24	65	2.9																						
18,000-----	19	96	1.6	17	82	7.0	12	10	2.0	15	87	11.8	19	81	6.5																						
20,000-----	15	76	8.1	16	80	7.3	10	64	3.8	14	86	14.9	15	82	13.5																						
22,000-----				10	85	13.5				10	89	20.4																									

Altitude (meters) m s l	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (84 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P.R. (28 m.)			Santa Maria, Calif. (72 m.)			
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		
Surface-----	31	141	0.9	31	314	2.9	31	115	2.2	30	217	1.6	31	186	0.3	31	271	4.0	31	115	3.9	31	1	1.6	31	127	0.4	31	123	4.5	31	99	3.9	31	264	3.4	
500-----	31	139	3.9	31	311	3.7	31	136	3.7	30	266	3.6	31	123	1.3	31	280	5.7	31	128	4.9	---	---	---	---	31	185	2.0	31	133	6.9	31	94	8.7	31	324	3.1
1,000-----	31	124	4.0	31	314	4.5	31	134	3.5	30	292	4.2	31	147	1.3	31	271	5.5	31	150	6.3	30	83	1.8	31	217	4.8	31	138	6.9	31	95	9.2	31	324	3.3	
1,500-----	31	122	3.1	31	306	2.6	31	127	2.8	30	302	5.1	31	106	1.0	31	257	4.0	31	166	4.5	30	159	3.1	31	301	4.9	31	128	4.9	31	96	8.5	31	42	1.9	
2,000-----	31	112	2.4	31	257	2.0	31	131	2.5	30	292	6.2	31	65	6.6	31	240	3.2	31	185	3.1	30	195	3.7	31	258	4.9	29	115	3.1	31	93	8.6	31	112	1.8	
2,500-----	31	83	2.1	31	128	4.1	31	136	2.1	30	278	7.3	31	122	4.4	31	225	3.6	30	311	2.2	30	223	4.0	31	273	5.5	29	92	2.2	31	97	8.7	31	197	2.0	
3,000-----	31	49	9.9	31	218	6.0	31	144	1.9	30	279	8.8	31	344	1.6	31	218	4.9	30	259	1.8	30	245	4.0	31	280	5.7	28	62	2.6	31	95	8.4	31	227	3.1	
4,000-----	31	322	1.5	31	221	7.8	31	165	1.5	29	273	10.0	31	309	1.5	31	232	6.5	30	321	2.1	30	276	7.2	31	287	6.6	24	54	2.7	29	99	6.5	31	233	6.5	
5,000-----	31	322	2.0	31	225	8.6	31	195	1.3	29	271	12.3	31	298	2.6	30	242	8.5	30	320	1.9	31	278	9.1	31	284	7.6	21	37	3.4	30	90	5.4	31	234	8.4	
6,000-----	31	328	2.1	30	232	10.1	31	201	1.9	26	269	13.1	31	287	4.4	30	254	10.0	30	330	2.8	30	280	11.2	31	288	10.0	17	43	3.0	31	103	4.9	31	242	9.1	
8,000-----	31	296	4.8	28	233	10.2	30	139	1.1	22	254	15.2	29	289	6.2	29	253	16.7	29	318	4.9	29	276	13.4	29	282	11.7	16	50	2.7	31	135	3.5	31	245	13.4	
10,000-----	28	288	7.6	22	229	15.8	29	96	3.0	22	259	18.9	29	285	9.3	23	246	18.7	29	303	7.0	24	266	20.5	28	284	16.6	15	79	1.0	30	174	1.6	29	290	19.3	
12,000-----	28	295	7.9	21	233	18.5	28	84	5.7	15	257	22.9	26	283	11.5	15	240	20.8	29	288	8.1	19	267	19.7	25	282	18.6	15	79	5.3	31	242	3.8	22	246	20.1	
14,000-----	27	302	5.9	17	233	17.7	27	101	4.7	10	270	19.4	22	297	7.1				28	293	4.8	19	273	16.0	23	285	15.8	15	106	1.5	31	330	1.0	19	305	15.7	
16,000-----	24	328	5.2	11	241	10.1	23	79	6.5				19	329	5.5				24	311	3.6	14	292	8.5													
18,000-----	17	61	4.8					20	105	10.2			17	45	4.1				21	81	4.0																
20,000-----	17	74	7.9					16	84	15.7			12	72	6.0				19	80	6.5																
22,000-----	11	85	11.7										10	81	6.3																						

Altitude (meters) m s l	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D.C. (88 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed	
Surface-----	31	274	1.1	31	192	1.5	31	357	2.1	31	150	0.5
500-----	31	275	3.0	---	---	---	---	---	---	---	---	---
1,000-----	31	291	4.1	31	216	2.2	30	229	2.6	31	351	1.0
1,500-----	31	300	4.4	31	307	2.9	30	193	1.7	31	288	4.1
2,000-----	31	310	5.0	31	234	3.4	30	202	2.1	31	299	5.2
2,500-----	31	311	5.9	31	241	3.9	30	202	2.2	30	303	5.7
3,000-----	30	306	5.7	31	242	4.9	29	220	3.6	30		

# SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun.

AUGUST 1953

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
ALBUQUERQUE, N. MEX.									
	Air mass								
	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08
August									
2-----	----	----	----	1.14	----	----	----	----	0.71
3-----	----	----	1.07	1.19	----	1.27	1.11	1.00	.88
4-----	0.89	0.99	1.11	----	----	1.29	1.20	.90	----
5-----	.78	.89	1.04	1.21	----	1.20	1.04	.87	----
6-----	1.00	1.08	1.21	1.30	----	1.30	1.14	1.00	----
7-----	.82	.92	1.05	1.20	----	1.28	1.12	1.05	.94
8-----	.84	.94	1.07	1.23	----	1.22	1.04	.91	.81
9-----	.71	.82	.99	1.19	----	1.27	----	----	----
10-----	.84	.93	1.07	----	----	----	----	----	----
11-----	.85	.97	1.08	1.22	----	----	----	----	----
15-----	----	----	----	1.25	----	----	----	----	----
17-----	----	.85	1.03	1.18	----	----	----	----	----
18-----	.78	.90	1.02	1.19	----	----	----	----	----
20-----	----	.84	----	1.18	----	----	----	----	----
21-----	.93	1.01	1.09	1.22	----	----	----	----	----
23-----	----	----	----	----	----	1.25	1.06	.93	.82
24-----	.90	.99	1.11	1.25	----	1.29	1.14	1.01	.93
25-----	.87	.95	1.09	1.27	----	1.21	1.06	.89	.80
26-----	.80	.90	1.04	1.19	----	1.21	1.08	.99	.86
27-----	.73	.82	.95	1.13	----	----	----	----	----
29-----	----	----	----	1.20	----	----	----	----	----
30-----	.91	1.01	1.14	1.29	----	1.35	1.14	.98	.85
31-----	.93	1.03	1.15	1.28	----	1.31	1.15	1.02	.91
Aver- ages	.85	.94	1.07	1.22	----	1.27	1.11	.96	.85
Depart- ures	+.09	+.07	+.08	+.07	----	+.08	-.05	+.02	-.01
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
August									
1-----	----	----	1.14	1.28	----	----	----	----	----
3-----	0.89	0.98	1.10	1.21	----	----	----	----	----
6-----	----	----	----	1.07	----	----	----	----	----
12-----	.57	.66	.79	.99	----	0.90	0.61	0.44	----
16-----	.78	.87	.98	1.15	----	----	----	----	----
18-----	.80	.90	.97	1.07	----	----	----	----	----
19-----	.64	.74	.90	1.05	----	----	----	----	----
20-----	.81	.91	1.03	1.19	----	1.21	1.00	.86	0.74
23-----	.66	.75	.91	1.11	----	----	----	----	----
24-----	.41	.49	.65	.90	----	----	----	----	----
29-----	----	----	----	.75	----	.68	----	----	----
30-----	.44	.54	.65	.75	----	----	----	----	----
31-----	----	----	----	----	----	----	.87	.78	.65
Aver- ages	.67	.76	.91	1.04	----	.93	.83	.69	.69
Depart- ures	+.01	-.02	+.02	-.01	----	-.10	-.03	-.02	+.06

\* Extrapolated

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
TABLE MOUNTAIN, CALIF.									
	Air mass								
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
August				1.41					
28----				1.44					
30----	1.11	1.20	1.30						
Aver-	1.11	1.20	1.30	1.42					
ages									
Depart-									
ures	-.02	-.02	-.02	+.00					
LINCOLN, NEBR.									
	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
August									
4----						1.08	0.92	0.79	0.69
7----						1.12	.94	.82	.71
12----				1.10		1.12	.92	.79	.69
13----				1.03		1.08	.92	.79	.71
14----				1.08					
17----				1.01					
18----				1.10		1.03	.84	.69	.56
22----			0.73	.90					
25----			.75	.90		.92	.75	.60	.50
26----			.82	.92		.94	.77	.64	.54
27----			.82	.99		.99	.79	.64	.56
28----			.77	.94		.94	.75	.60	.50
Aver-			.78	1.00		1.02	.84	.71	.61
ages									
Depart-			-.08	-.12		-.03	-.02	-.02	-.01
ures									
MADISON, WIS.									
	Air mass								
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
NO DATA DURING AUGUST 1953									
BOSTON, MASS.									
	Air mass								
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
NO DATA DURING AUGUST 1953									

pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.



# SOLAR RADIATION DATA

AUGUST 1953

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

	Avg															Avg										Avg	
Date-----	6	7	8	9	10	11	12		13	14	15	16	17	18	19		20	21	22	23	24	25	26				
Langleys----	151	150	123	119	131	124	123	132	139	127	117	127	102	127	125		123	101	112	114	117	102	81	126			108
Date-----	27	28	29	30	31	1	2																				
Langleys-----	113	111	93	104	81	83	89	97																			

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

																Avg																Avg
Date -----	6	7	8	9	10	11	12		13	14	15	16	17	18	19		20	21	22	23	24	25	26									
Langleys -----	375	339	223	107	110	156	347	237	248	156	222	361	109	377	353	261	361	278	369	361	320	66	192				278					
Date -----	27	28	29	30	31	1	2																									
Langleys -----	93	297	281	310	201	337	294	259																								

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

								Avg									Avg											Avg
Date-----	6	7	8	9	10	11	12		13	14	15	16	17	18	19		20	21	22	23	24	25	26					
Langleys--	256	292	289	112	162	196	295	229	292	116	256	281	101	274	219		220	301	186	275	275	311	71	265			241	
Date-----	27	28	29	30	31	1	2																					
Langleys-----	145	314	323	323	309	377	317	301																				

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

								Avg									Avg											Avg
Date-----	6	7	8	9	10	11	12		13	14	15	16	17	18	19			20	21	22	23	24	25	26				
Langleys-----	150	240	322	105	262	184	320	226	289	110	320	241	128	256	216		223	347	243	285	318	213	111	236			251	
Date-----	27	28	29	30	31	1	2																					
Langleys-----	174	233	240	243	267	322	132	230																				

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

								Avg									Avg										Avg
Date-----	6	7	8	9	10	11	12		13	14	15	16	17	18	19		20	21	22	23	24	25	26				
Langleys-----	221	244	109	186	202	195	128	184	219	202	182	143	168	127	124	166	94	146	133	131	148	121	218			142	
Date-----	27	28	29	30	31	1	2																				
Langleys-----	179	165	127	167	117	66	117	134																			

Note Langley is the unit used to denote one gram calorie per square centimeter





## SOLAR RADIATION DATA

Table 33—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langley's—Continued

AUGUST 1953

1953	Lander, Wyo.	Las Vegas, Nev.	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCB)	Madison, Wisc.	Medford, Ore.	Miami, Fla.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Ottawa, Ontario	Phoenix, Ariz.	Portland, Me.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	San Antonio, Texas	Santa Maria, Calif.	Saville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (U. of W.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Is., B. W. I.	Tampa, Fla.	Toronto, Canada	Upton, N. Y.	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba	
Aug. 6-----	735	747	613	515	742	600	363	715	381	553	626	544	707	699	733	598	533	688	705	637	700	535	372	199	201	582	607	556	703	628	646	---	294	
Aug. 7-----	765	668	628	850	758	647	655	684	539	425	708	539	---	680	608	657	673	662	664	686	685	385	359	462	504	162	350	662	509	471	371	---	645	
Aug. 8-----	717	716	621	687	610	586	752	637	625	425	133	675	216	675	665	655	593	656	728	651	423	365	442	274	292	695	668	371	384	368	---	639		
Aug. 9-----	805	559	570	725	481	618	522	745	531	198	156	560	513	609	613	699	---	609	709	661	182	143	298	426	439	170	669	677	729	179	---	612		
Aug. 10-----	487	639	604	675	379	405	547	734	616	368	474	612	77	522	256	698	203	594	692	509	568	527	651	656	334	660	663	536	411	589	---	570		
Aug. 11-----	735	618	387	634	315	500	311	718	620	530	654	591	632	645	334	699	633	575	696	460	548	598	362	629	649	---	629	623	598	434	615	---	420	
Aug. 12-----	742	544	554	530	691	613	609	698	428	575	535	619	652	667	669	633	721	650	569	548	646	446	589	638	587	597	659	551	609	540	629	---	643	
Averages-----	684	642	583	631	568	567	651	721	635	454	508	514	466	642	510	663	560	633	680	593	493	352	474	459	395	609	611	556	460	478	---	546		
Departures-----	---	---	---	---	---	---	+31	---	---	-22	+86	---	---	---	---	---	---	---	+76	---	---	---	---	---	---	-58	---	---	---	---	---	---	---	
Aug. 13-----	691	385	645	375	476	588	643	605	533	489	527	563	612	692	594	672	706	649	576	580	535	305	516	650	648	544	664	681	437	564	537	---	470	
Aug. 14-----	482	629	610	565	537	634	577	571	520	129	61	428	669	654	476	592	592	657	645	525	61	275	36	619	630	506	632	652	411	572	72	---	563	
Aug. 15-----	419	637	470	460	468	637	371	711	393	498	601	615	641	666	465	609	519	658	668	594	403	592	276	316	576	633	652	618	577	535	---	569		
Aug. 16-----	683	718	584	587	663	636	610	709	356	553	619	480	515	690	671	691	578	675	---	703	644	478	589	354	367	575	183	424	453	582	---	586		
Aug. 17-----	516	739	582	501	650	617	575	702	438	165	233	672	673	677	585	674	617	---	686	129	440	475	463	510	489	345	591	454	582	135	---	609		
Aug. 18-----	359	723	630	491	712	660	551	671	543	---	681	400	493	639	697	638	526	691	---	684	630	489	557	577	619	652	164	626	444	576	650	---	610	
Aug. 19-----	635	694	480	660	734	641	635	587	407	429	572	491	463	650	446	560	675	664	---	673	551	485	627	586	596	653	614	434	620	616	---	572		
Averages-----	542	645	572	520	606	631	656	651	456	367	471	459	581	670	556	639	602	666	---	646	449	417	447	495	525	554	470	526	561	449	---	577		
Departures-----	---	---	---	---	---	---	+105	---	---	-91	+74	---	---	---	---	---	---	+10	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Aug. 20-----	667	679	541	683	531	577	599	652	542	558	487	485	679	642	585	557	576	---	---	707	569	498	554	494	---	661	627	587	536	461	527	---	549	
Aug. 21-----	441	694	541	654	701	610	584	643	606	582	429	494	641	655	670	657	599	---	---	639	664	487	497	470	549	636	633	654	328	415	565	---	527	
Aug. 22-----	373	712	590	499	707	639	478	619	478	535	586	190	640	601	656	547	594	694	---	738	505	508	544	384	389	509	554	431	615	396	562	---	575	
Aug. 23-----	660	667	659	659	660	527	545	439	516	399	601	667	681	667	681	581	558	677	---	733	593	513	566	249	312	550	474	513	534	---	575	---	300	
Aug. 24-----	707	445	823	709	616	552	548	326	496	576	503	398	624	522	516	552	696	---	691	599	429	551	229	434	567	507	468	310	534	---	504	---	475	
Aug. 25-----	643	550	589	645	718	632	543	166	671	278	538	528	480	579	289	386	639	647	---	692	582	457	535	---	305	596	620	684	519	440	---	507	---	525
Aug. 26-----	451	589	578	596	738	639	543	222	396	379	524	516	489	546	476	375	545	672	---	692	516	243	528	211	335	392	652	648	420	486	516	---	523	
Averages-----	549	657	548	623	686	625	546	485	515	480	522	445	558	616	555	517	595	677	---	693	575	448	539	339	371	559	572	570	470	457	535	(531)	491	
Departures-----	---	---	---	---	---	---	-9	---	---	+7	+136	---	---	---	---	---	---	+13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Aug. 27-----	589	647	598	625	732	642	557	603	520	402	562	533	553	553	279	495	392	669	---	653	547	415	507	300	392	520	565	522	573	469	547	495	506	
Aug. 28-----	561	704	578	358	655	508	526	228	260	423	527	533	519	651	544	356	610	660	---	689	528	416	495	315	245	491	557	295	323	479	519	512	236	
Aug. 29-----	686	691	578	433	645	505	544	161	267	483	576	581	554	670	577	497	622	552	---	653	576	---	516	521	549	559	588	620	522	457	580	345	---	
Aug. 30-----	663	699	586	587	614	446	623	419	471	509	556	406	683	589	569	606	562	---	698	525	---	509	533	277	472	455	631	579	487	528	500	515	---	
Sept. 1-----	659	655	451	617	616	506	537	598	292	459	506	462	613	681	616	585	619	627	---	658	492	---	516	237	170	559	532	577	462	496	504	450	---	
Sept. 1-----	641	673	588	580	602	503	517	501	570	513	526	490	539	668	---	562	426	613	---	637	587	---	524	82	128	510	562	597	223	464	584	465	541	
Sept. 2-----	310	674	556	459	380	461	490	627	580	453	519	532	460	680	---	605	475	525	---	600	512	---	494	460	444	508	551	524	463	515	491	237	---	
Averages-----	587	678	562	523	606	510	519	528	415	469	523	534	513	655	521	528	536	601	---	641	538	---	509	324	(318)	517	544	538	463	477	537	498	404	
Departures-----	---	---	---	---	---	---	+106	---	---	+51	+162	---	---	---	---	---	---	+88	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	

Accumulated Departures January 1 to September 2, 1953

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

## ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

AUGUST 1953

Station	Day of month																																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average	
Baltimore, Md.-----	466	---	760	248	648	---	322	312	418	650	754	723	650	124	752	680	441	734	---	760	576	698	699	729	634	608	663	602	630	591	672	594	
Philadelphia, Pa.-----	705	172	634	198	---	---	754	357	256	604	738	378	546	33	636	674	252	---	735	562	525	550	594	640	606	588	585	540	---	---	---	514	
Washington, D. C. (WBCO)-----	---	---	460	259	600	311	315	---	---	605	666	709	571	295	729	605	---	---	---	---	---	---	---	---	---	619	605	616	582	561	556	644	543

The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continu-

ous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in Illumination Engineering, Vol. XLVI No. 2, pages 59 to 62.

NWRC, Asheville, N.C. --- 11/25/53 --- 2000







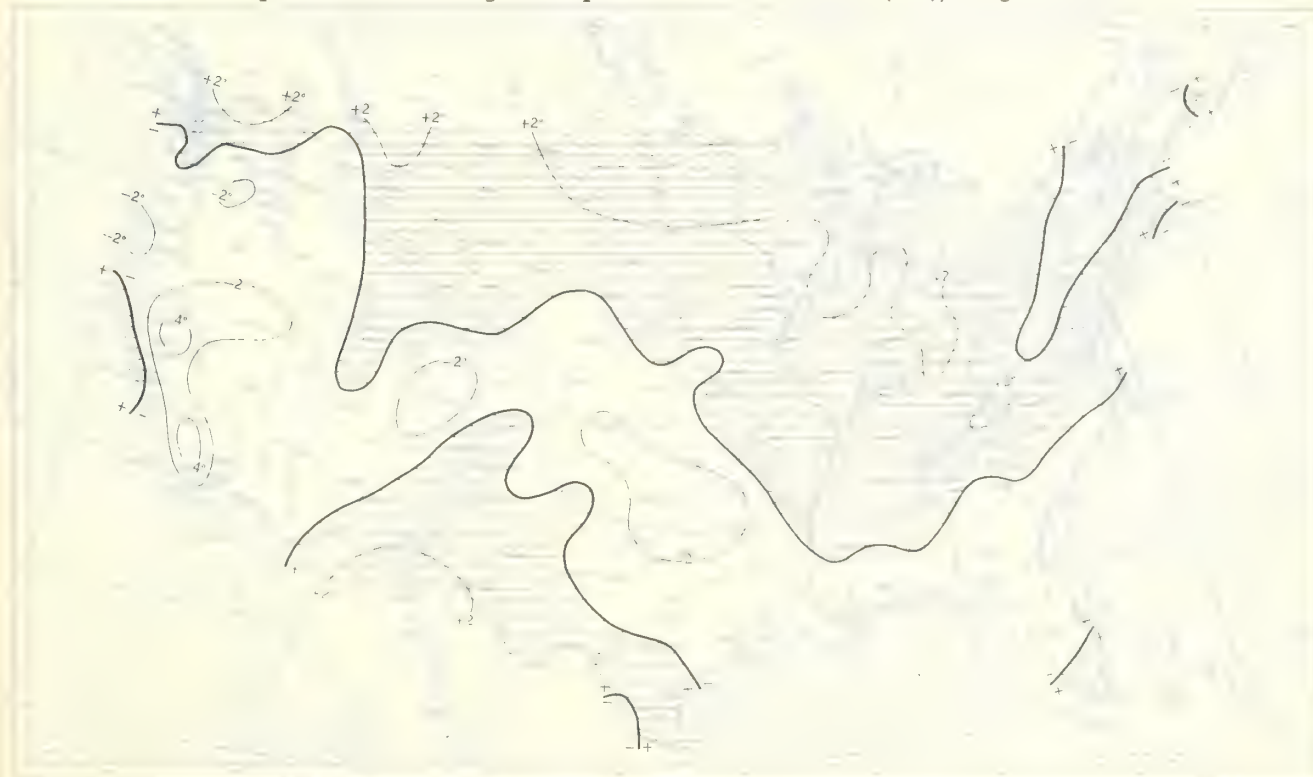




Chart I. A. Average Temperature ( $^{\circ}\text{F.}$ ) at Surface, August 1953.



B. Departure of Average Temperature from Normal ( $^{\circ}\text{F.}$ ), August 1953.



A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

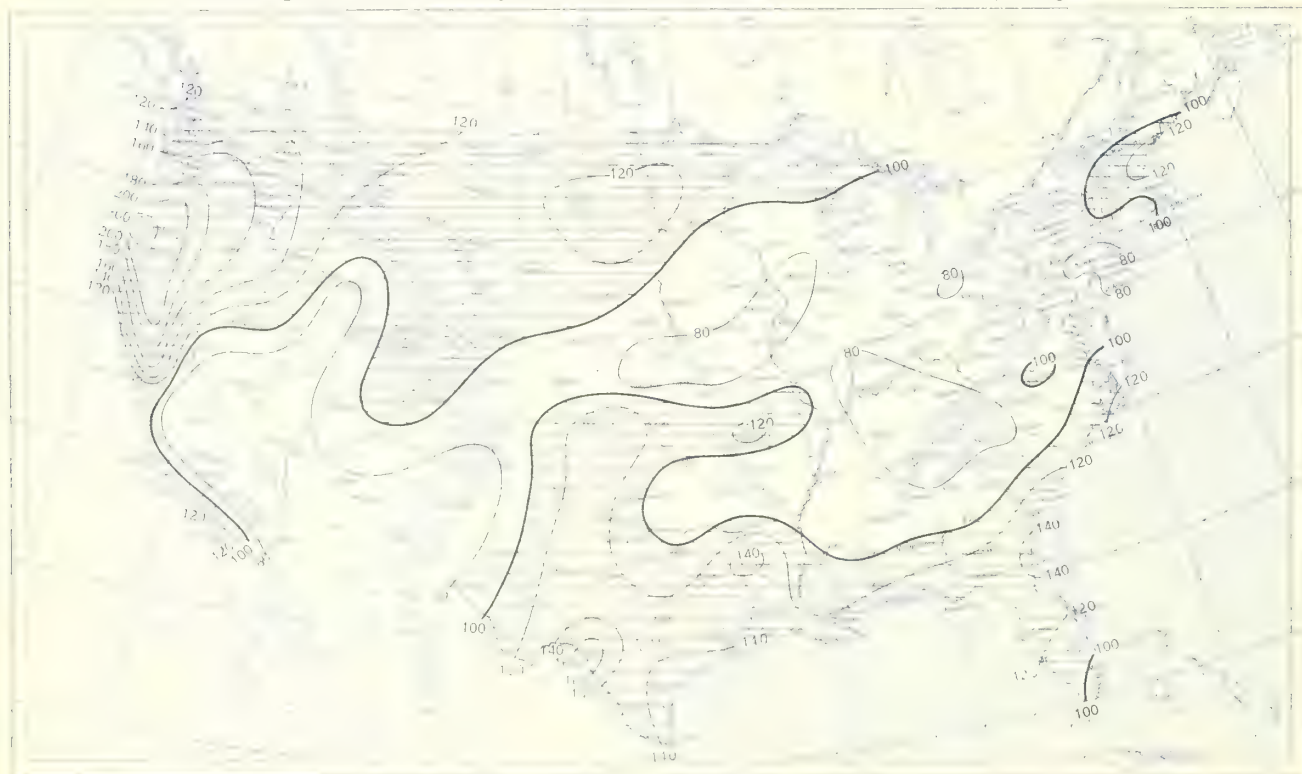
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.



Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, August 1953.



B. Percentage of Normal Sky Cover Between Sunrise and Sunset, August 1953.

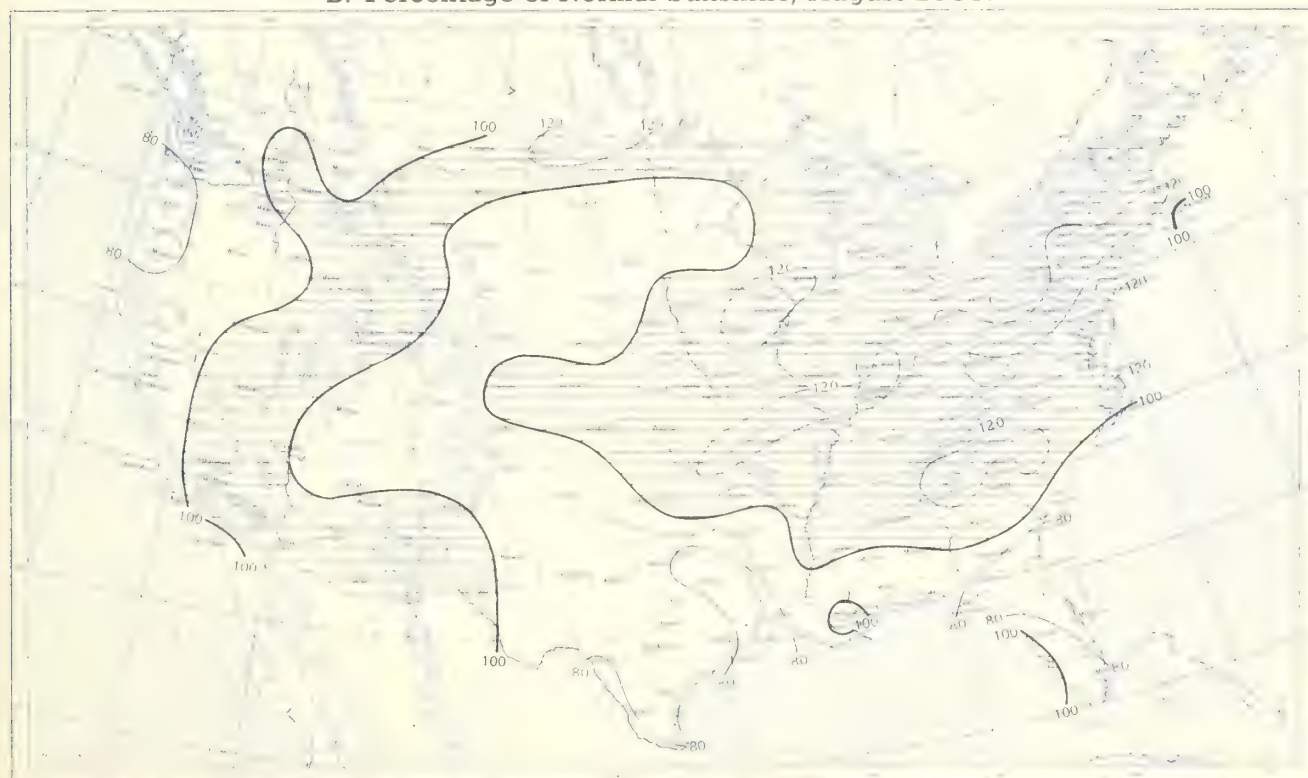


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, August 1953.



B. Percentage of Normal Sunshine, August 1953.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.



Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, August 1953. Inset: Percentage of Normal Average Daily Solar Radiation, August 1953.



Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langley's (1 langley = 1 cal. cm.<sup>-2</sup>). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, August 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar.  
 Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.



Chart X. Tracks of Centers of Cyclones at Sea Level, August 1953.

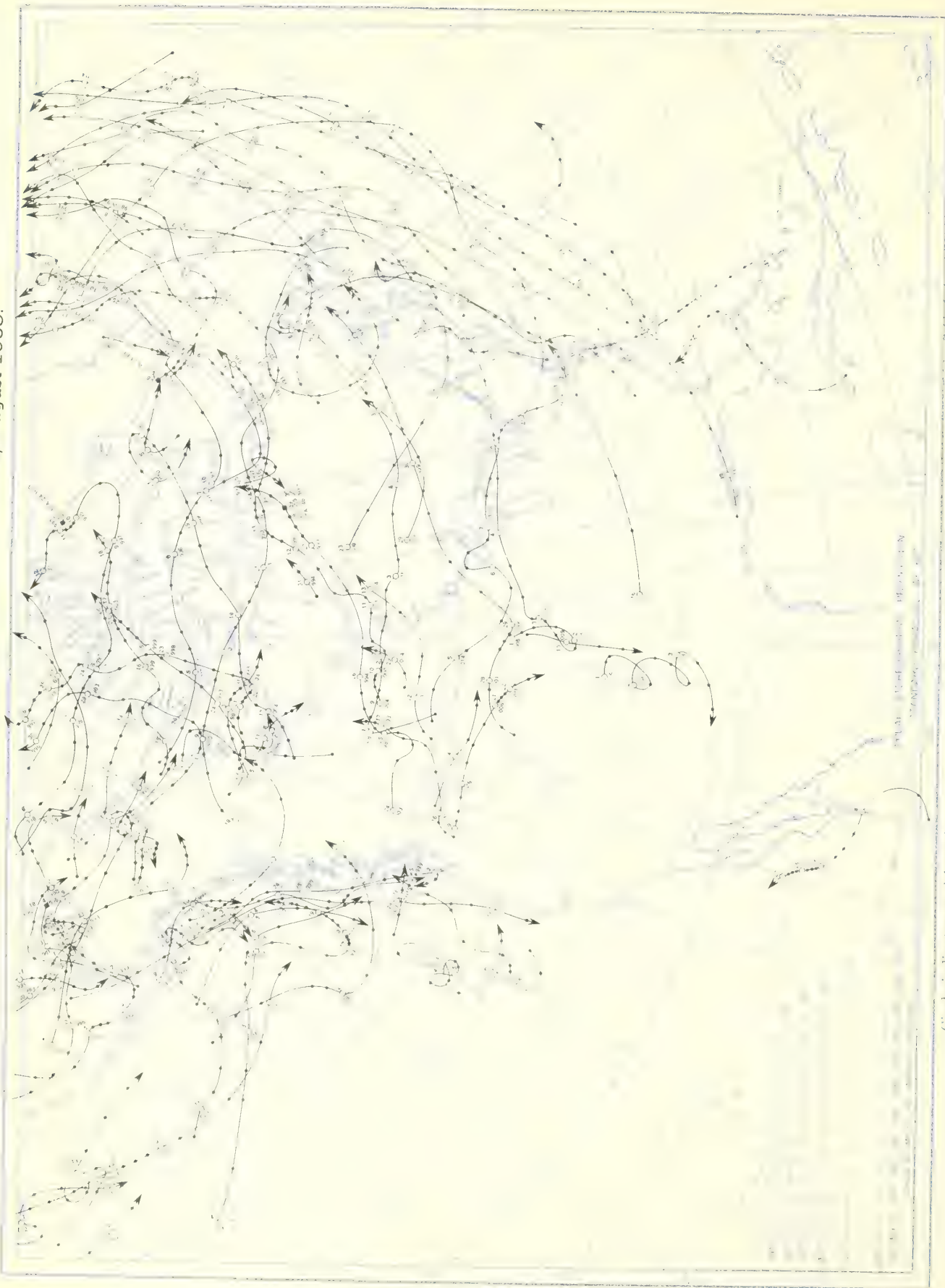
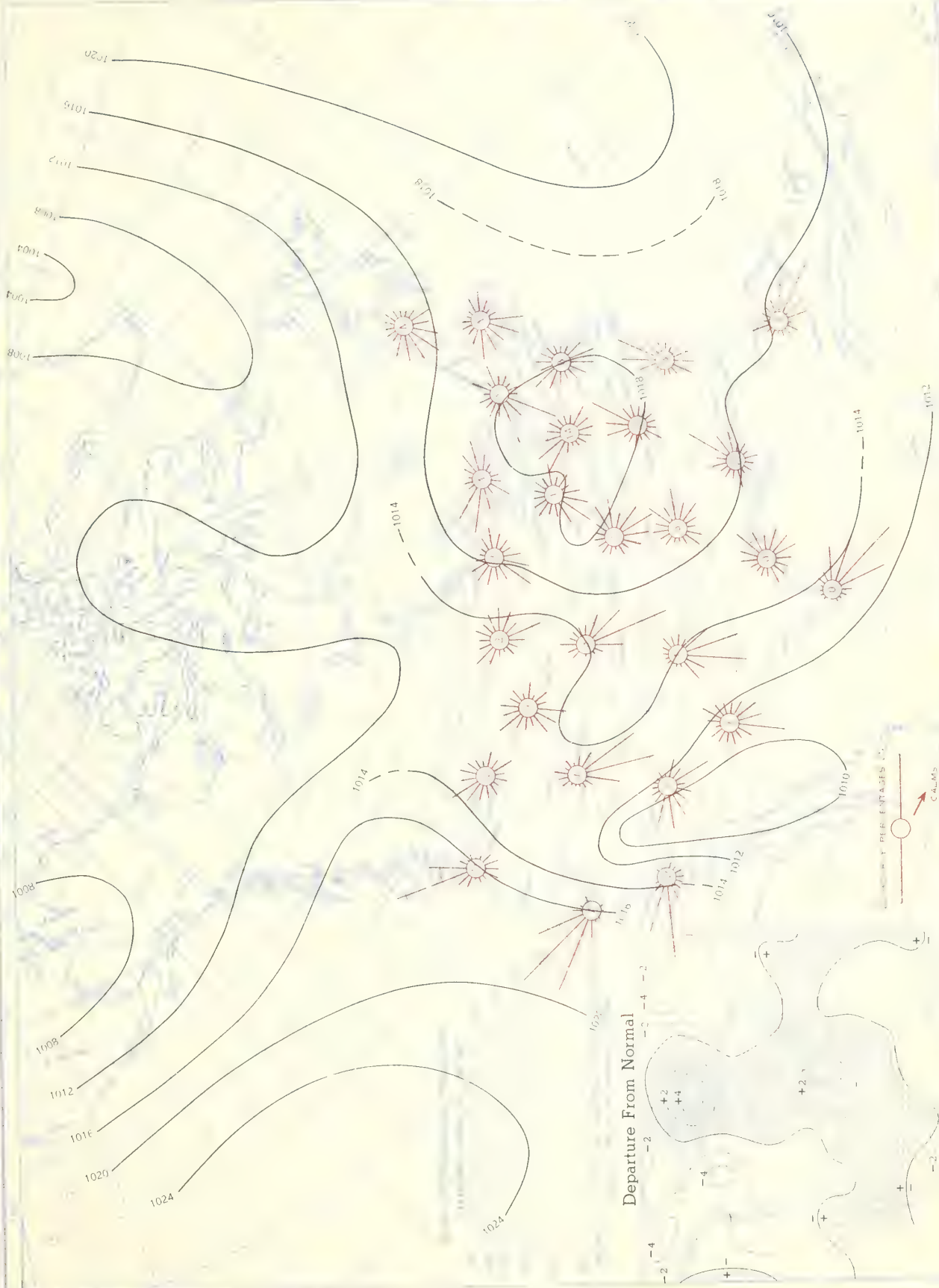


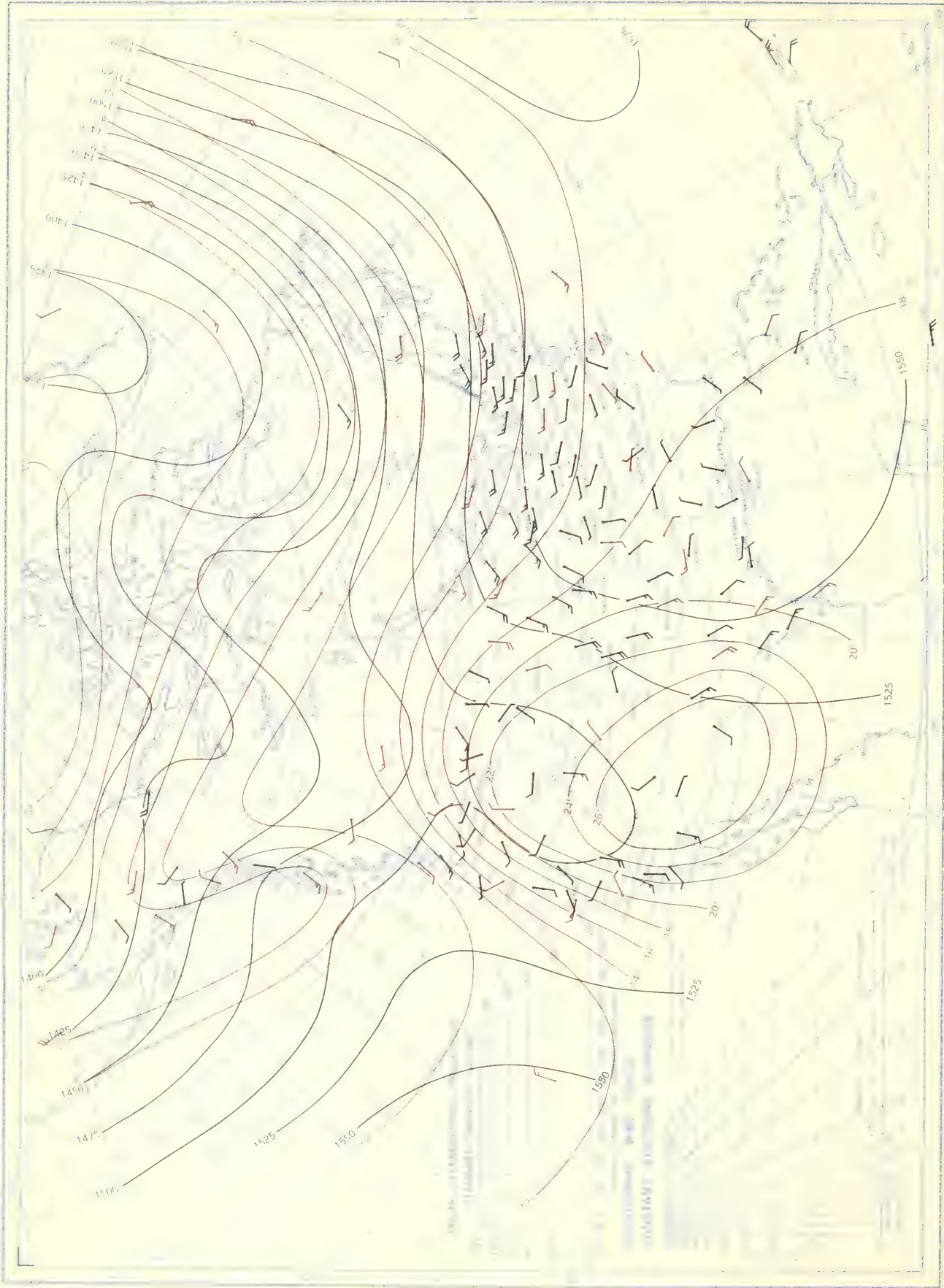
Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, August 1953. Inset: Departure of Average Pressure (mb.) from Normal, August 1953.



Average sea level pressures are obtained from the averages of the 7:30 a.m. and 7:30 p.m. E.S.T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10 inter-sections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

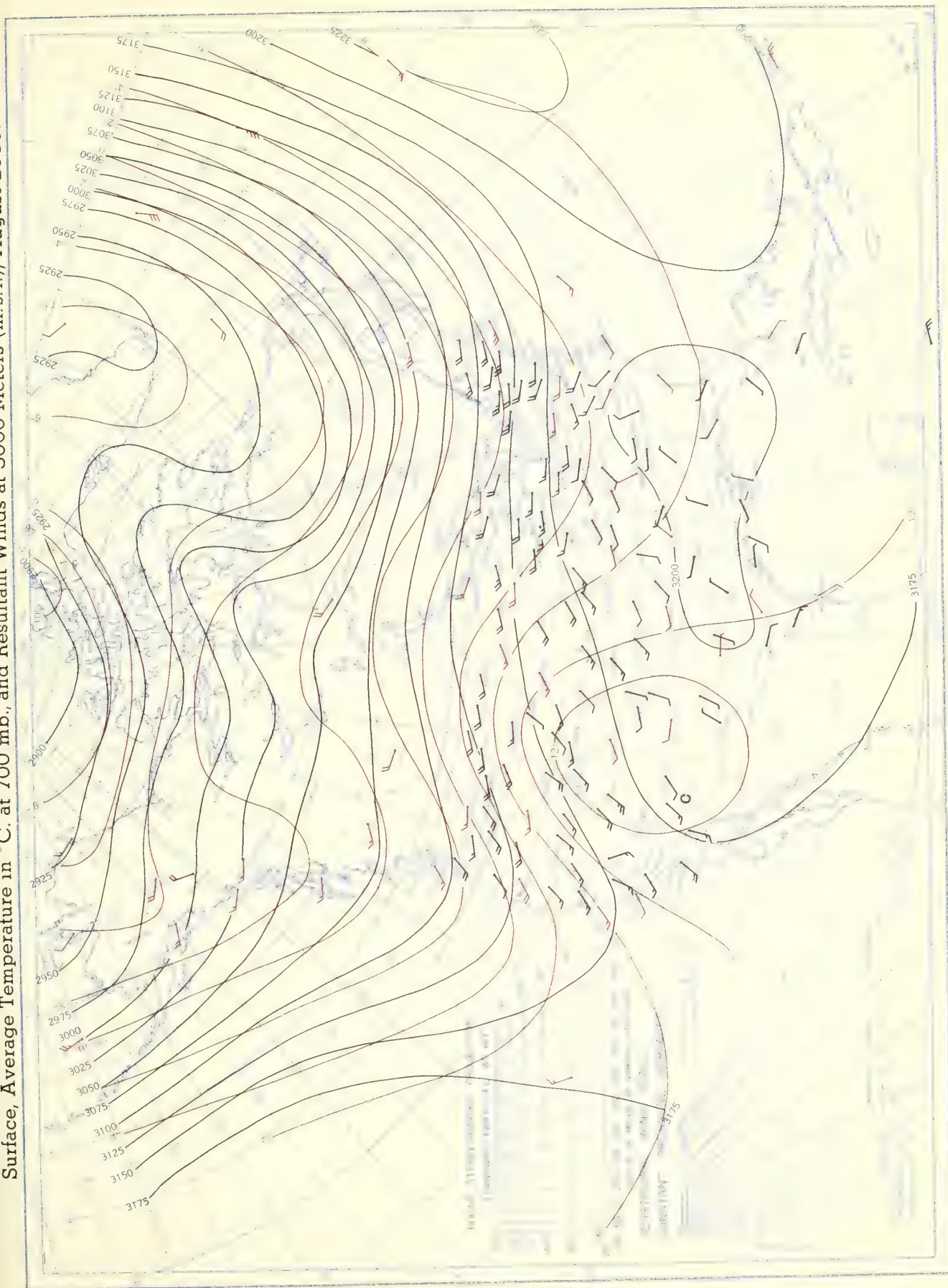


Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), August 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

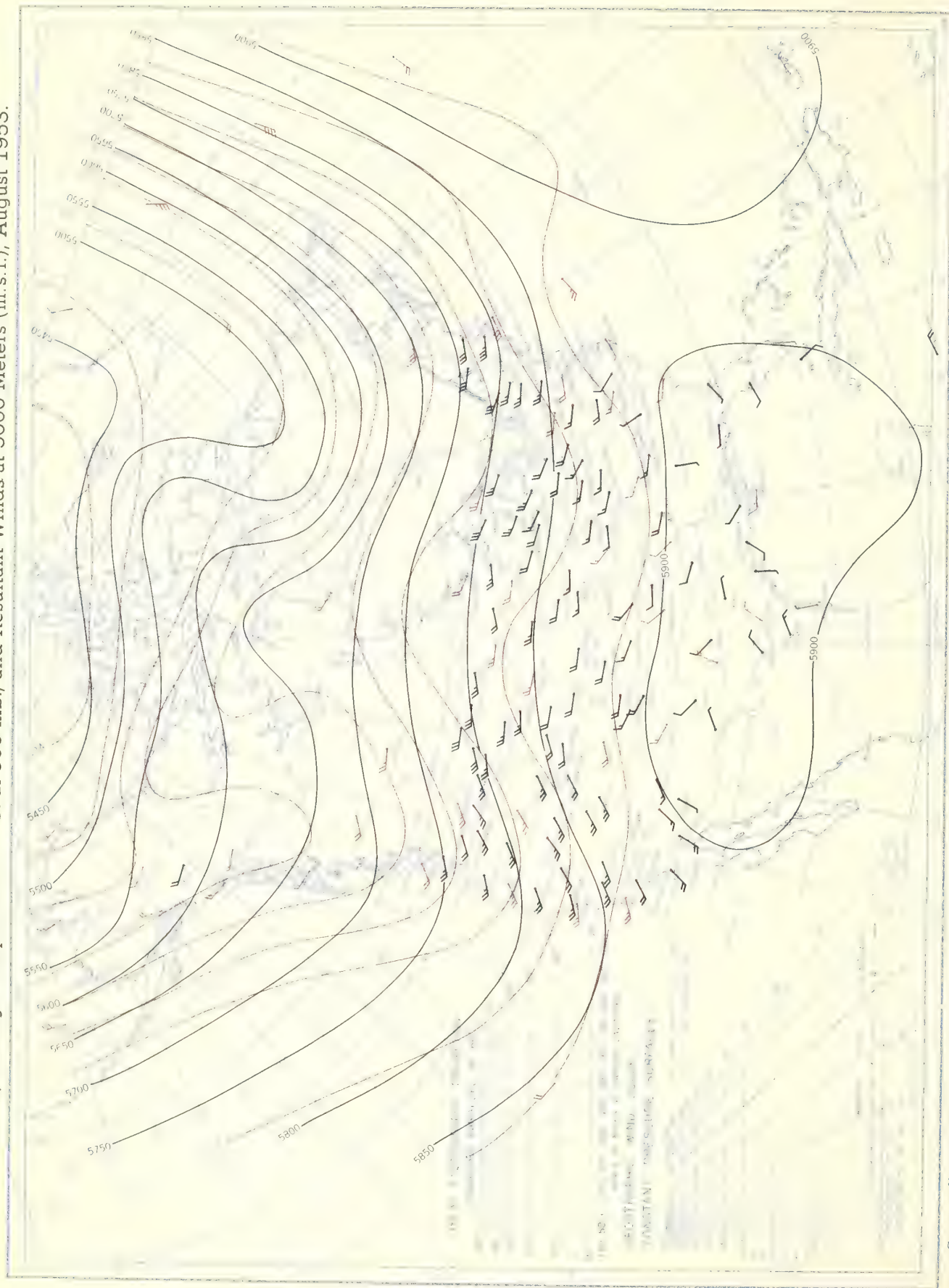
Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), August 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

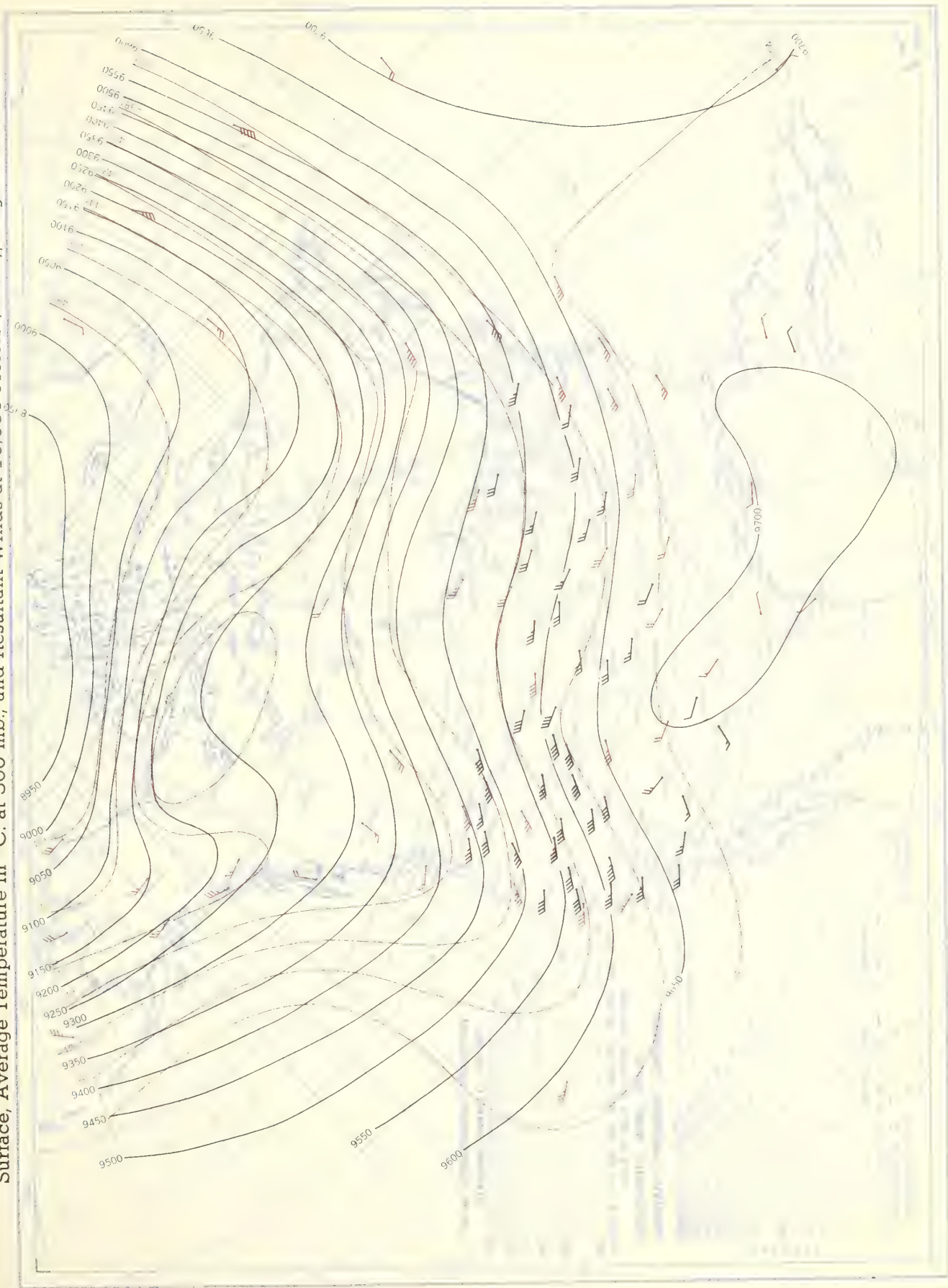


Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), August 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), August 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.



U. S. Department of Commerce

WEATHER BUREAU

Official Business

Permit No. 1024

Clemson College Library  
Clemson  
South Carolina

CD

Penalty for private  
use to avoid pay-  
ment of postage  
\$300.

U. S. DEPARTMENT OF COMMERCE

SINCLAIR WEEKS, Secretary

WEATHER BUREAU

F. W. REICHELDERFER, Chief

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

SEPTEMBER 1953

Volume 4 No. 9





# C O N T E N T S

SURFACE DATA	Page
General Summary of Weather Conditions-----	299
Condensed Climatological Data - States-----	301
Climatological Data - Stations-----	302
Heating Degree Days-----	306
Severe Storms-----	307
General Summary of River and Flood Conditions-----	312
Flood Stage Data-----	313
UPPER AIR DATA	
Radiosonde Data-----	314
Pilot Balloon Data-----	317
Rawin Data-----	318
SOLAR RADIATION DATA	
Solar Radiation Intensities-----	319
Blue Hill Data-----	320
Daily Totals and Average Daily Totals by Weeks-----	321
Daily Illumination on a Horizontal Surface-----	323
CHARTS I-XV	

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

SUBSCRIPTION PRICE: Monthly and annual, 15 cents per copy; yearly subscription, including monthly and annual issues, \$1.50. Checks and money orders should be made payable to the "Treasurer of the United States." Remittance and correspondence regarding subscriptions should be sent to "Superintendent of Documents, Government Printing Office, Washington 25, D.C."

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

Volume 4 No. 9

SEPTEMBER 1953

### GENERAL SUMMARY OF WEATHER CONDITIONS

As warm, unusually dry, sunny weather prevailed generally during September, drought continued to plague large areas east of the Rocky Mountains, and by the end of the month had covered the whole Country except in the far Southeast, middle and northern Pacific coastal sections, and a few local areas. Nationwide precipitation and temperature averages remained below and above normal, respectively, for the fourth consecutive month, and in most of the Country this was one of the sunniest Septembers on record. September sunshine (percent of amount possible) set new records at a number of locations including the following: El Paso, Tex., 98% (record for any month); Albuquerque, N. Mex., 95%; Oklahoma City, Okla., 94%; Kansas City, Mo., 92%; Sioux City, Iowa, 89%; and Madison, Wis., 81%. The number of thunderstorms this month was above normal in northern California, from the eastern Dakotas to southern New England, and in the south Atlantic States, but below normal in most other sections.

The September drought created a high fire hazard, retarded the seeding and development of winter grains, threatened water supplies and was particularly detrimental to pastures and some late miscellaneous crops. Major crops were generally mature or too near maturity to be seriously affected, although drought during mid and early summer had caused considerable damage in many areas. The dry, sunny weather, on the other hand, was ideal for harvesting operations which advanced rapidly toward completion.

**PRECIPITATION.**--In the lower Ohio and central and upper Mississippi Valleys and nearly all the western half of the Nation, September rainfall was less than 25 percent of normal. Nearly half of the stations in the western portion of the lower Great Plains and far Southwest and several additional stations in the Midwest had no rain at all.

Statewide averages for Arizona (0.02), New Mexico (0.16), and Colorado (0.14) were the lowest on record, and for Utah (0.08) the second lowest on record. In these four states 321 stations received no rain at all and many others only a trace. More than half of the stations in Nevada and 42 percent in New Mexico had no measurable amounts, and in the latter State only 7 stations had totals of an inch or more.

A few of the many long-record stations that reported the least amount of rainfall on record for September were the following: Winslow and Phoenix, Ariz., (0.00); Colorado Springs, Colo., (T); Lewiston, Idaho, (0.04); Louisville, Ky., (0.27); Jackson, Miss., (0.24); Rochester, Minn., (0.33); Scottsbluff, Nebr., (T); Valentine, Nebr., (0.07); and Roswell, N. Mex., (T).

In sharp contrast to this record dry weather, monthly totals ranged up to 400 percent of normal along the north Pacific Coast and in the far Southeast. Record 24-hour amounts of 1.91 on the 29-30th and 8.89 inches on the 26-27th for September were recorded at Seattle, Wash., and Montgomery, Ala., respectively.

The heaviest rains in the Southeast fell during the passage of hurricane "Florence" on the 26th and 27th. This storm accounted for nearly half of the rainfall in South Carolina where the prolonged drought was effectively broken; it also brought the most general rains to North Carolina since last spring, although totals were less than an inch in half the State's area. Lockhart, Ala., reported 10.60 inches of rain on the 26th, and a storm total of 14.71 inches. Monthly totals in the Southeast ranged up to 24.46 inches at Pompano Beach, Fla.; 22.86 at Brunswick, Ga.; 17.31 at Lockhart, Ala.; and 11.96 inches at Toxaway, N. C.

Snowfall during September was more conspicuous by its absence than its quantities. No measurable amounts were reported in Oregon, even at high mountain stations, and in the northern Rockies the only measurable amount reported was 2 inches at Kings Hill, Mont., on the 2-3d. The first snowfall of the season in South Dakota occurred as traces in the Black Hills on the 2d. In Michigan the season's first snowfall occurred at Sault Ste. Marie on the 12th, and on the 14th snow flurries were reported in parts of New England.

**TEMPERATURE.**--One of the most prolonged and severe late season heat waves on record occurred in the northeastern quarter of the Country during the last week of August and the first 3 or 4 days of September. At Detroit, Mich., and Chicago, Ill., the temperature rose to 90° or above on 11 consecutive days (a new all-time record) and on 10 of these days it reached 95° or higher. A new September high was established for Pennsylvania when Stroudsburg recorded 106° on the 3d, and the September high of 108° for Indiana was equaled at Madison on the 2d. At Hartford, Conn., the mercury rose to the highest point (101.1°) for September since the beginning of the station, and at a great many other stations maximum temperatures on the 1st, 2d, or 3d established new station records for September, a few of which follow: Williamsport, Pa., 102°; Lexington, Ky., Cleveland, Ohio, and Chicago, Ill., 101°; Trenton, N. J., Albany and Binghamton, N. Y., 100°; Alpena, Mich., 99°; Buffalo, N. Y., 98°; and Elkins, W. Va., 97°.

An influx of cool Canadian air east of the Rocky Mountains broke this heat wave in central areas on the 3d and 4th and in the East on the 5th, and cooler than normal weather prevailed during most of the remainder of the month in north-central and eastern areas. But unseasonably hot weather again returned to the south-central interior at the beginning of the third week and continued in the lower Great Plains until the end of the month. Temperatures rose to record-breaking high levels for so late in the season in the central Great Plains on the 17th when Concordia, Kans., and St. Joseph, Mo., recorded 102° and in the Midwest on the 18th when Louisville, Ky., and Evansville, Ind., recorded 99° and 98° respectively. Another heat wave



# GENERAL SUMMARY OF WEATHER CONDITIONS--Continued

SEPTEMBER 1953

over the south-central interior began with rising temperatures on the 26th and reached a peak on the 27th, 28th, and 29th. During this 3-day period 100° maxima were recorded at most stations in Texas (the average maximum for the State was 100° on the 27th), Oklahoma, western portions of Kansas and Nebraska, Arkansas, Missouri, southern Iowa, and southern Illinois, and northern Louisiana. At many stations these high temperatures established new records for so late in the season. A few of these are: Concordia, Kans., 105°; Ft. Smith, Ark., 104°; Springfield, Mo., 101°; Shreveport, La., 103°; Laredo, Tex., 102°;--all on the 28th; Springfield, Ill., 100° on the 29th; Topeka, Kans., 104° on the 28th; Des Moines, Iowa, 99° on the 28th; St. Louis, Mo., 101° on the 29th; Kansas City, Mo., 103° on the 28th.

The coolest weather east of the Rocky Mountains occurred on the 13th and 14th and from about the 20th to the 24th. Most stations in the Lake Region and Southeast recorded their monthly minima during the first period, and on the 13th frost occurred in patches from northern Iowa and Minnesota eastward to Michigan and was heavy in northern Minnesota and sheltered low spots elsewhere. Most other stations east of the Rocky Mountains recorded their lowest temperatures of the month during the second period when the first general killing frosts of the season were reported in North Dakota and Minnesota on the 21st, in northern Illinois on the 22d, and in New England, eastern and central New York, and parts of Pennsylvania on the 23d and 24th.

September was a few degrees warmer than normal throughout the Rocky Mountain and Pacific States, with highest temperatures occurring at most stations during the second week. The month's highest temperature, 118°, was recorded at Cow Creek in

Death Valley, Calif., on the 12th. Temperatures were slightly below normal in the Rocky Mountain States during the first week, and in the Pacific States during the last week. Fraser, Colo., recorded 8° on the 25th for the month's lowest temperature.

**DESTRUCTIVE STORMS.**--September storm damage totaled approximately \$8,000,000, slightly more than half of which was caused by two hurricanes and most of the remainder by wind in north-central Illinois and a hailstorm in Texas.

The first of the two hurricanes, "Carol", moving northward in the Atlantic on the 6th and 7th, brushed the New England Coast where gale force winds and heavy seas caused marine damage (mostly to fishing craft) and some property damage on shore that altogether was estimated at \$1,070,000.

The second hurricane, "Florence", moving up from the Gulf of Mexico, entered the mainland of the United States in northwestern Florida on the morning of the 26th and with diminishing intensity curved northeastward across southeastern Alabama and southern Georgia during the next 24 hours. Accompanying winds and heavy rains caused losses (mostly to crops) of \$100,000 to \$200,000 in Florida, \$3,162,500 in Alabama, and moderate losses in Georgia.

Strong winds occurred at scattered points in an 8-County area of north-central Illinois when thunderstorms developed there about 7:00 p.m. on the 26th. Total damage was estimated at \$2,000,000.

The Texas hailstorm caused damage in Deaf Smith, Castro, and Hale Counties on the 18th, with heaviest damage in the latter County where unharvested cotton equivalent to 5,000 bales was destroyed. Total damage for the three Counties exceeded \$750,000.

# CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

SEPTEMBER 1953

Section	Temperature								Precipitation							
	Average	Departure from normal	Station	Monthly extremes				Average	Departure from normal	Station	Monthly extremes					
				Highest	Date	Station	Lowest				Date	Greatest	Station	Least		
	°F.	°F.		°F.			°F.		In.	In.		In.		In.		
Alabama	74.3	-1.2	2 Stations	103	"1	Valley Head	37	14	4.84	+1.46	Lockhart	17.31	Red Bay	0.55		
Arizona	74.0	+1.3	Parker	114	12	Maverick	18	29	.02	-1.37	Betatakin	.74	163 Stations	.00		
Arkansas	74.7	+6.4	4 Stations	106	"28	Gilbert	32	23	.99	-2.33	Ropper	2.99	2 Stations	.00		
California	72.0	+2.3	Cow Creek	118	12	Boca	20	30	.04	-.31	Klamath	2.21	376 Stations	.00		
Colorado	60.7	+2.3	Eversoll Ranch	101	16	Fraser	18	25	.14	-1.25	Ames	1.85	37 Stations	.00		
Connecticut	64.0	+1.4	Waterbury	103	2	Wansfield Hollow Dam	24	24	1.83	-1.99	Falls Village	4.64	Natchaug Ranger Sta.	.43		
Delaware	68.8	+3.3	3 Stations	100	"1	Millsboro	35	14	2.17	-1.24	Wilmington City Hall	3.95	Millsboro	.94		
Florida	79.2	-.2	Milton Exp. Sta.	99	5	2 Stations	56	"8	10.52	+3.65	Pompano Beach	24.46	Raiford St. Prison	5.11		
Georgia	73.9	-1.8	2 Stations	100	"1	Blairsville Exp. Sta.	32	14	8.27	+4.37	Brunswick	22.86	Tallapoosa 2NNW	2.04		
Idaho	60.6	+3.3	Orofino	103	11	Dixie	16	29	.18	-.81	Clark Fork 1ENE	.95	14 Stations	.00		
Illinois	68.8	+1.1	Flora	108	1	Vandalia CAA AP	31	22	1.59	-2.05	Rushville	3.92	Grand Tower	.02		
Indiana	67.4	+1	Madison	108	3	Greensburg 3SW	30	22	1.20	-2.08	Bluffton Water Wks.	2.73	Salem	.16		
Iowa	64.8	+4	Fairfield	103	1	Carroll 2SSW	25	22	.95	-3.06	Maquoketa 6NE	2.33	Sac City	.28		
Kansas	72.2	+2.2	8 Stations	107	"28	Atwood	30	21	1.21	-1.72	Independence	4.48	4 Stations	.00		
Kentucky	69.8	-.4	2 Stations	106	"1	2 Stations	32	23	1.17	-1.72	Inez	3.42	Hicksville	.00		
Louisiana	77.3	-.6	3 Stations	104	"28	Logansport	39	23	.96	-2.77	Burwood	5.37	4 Stations	.00		
Maine	58.6	+8	2 Stations	97	2	Greenville	25	24	2.85	-.71	Bar Harbor	7.91	Houlton 1NE	1.40		
Maryland	67.8	+3	Keedysville	105	2	Oakland	26	23	3.13	-.27	Parkton 2SW	6.41	Picardy	.47		
Massachusetts	65.4	+1.2	Lake Cochituate	103	1	Birch Hill Dam	20	24	2.40	-1.25	Chatham	6.75	Westover Field	.82		
Michigan	60.1	+1	Caro State Hospital	102	1	Champion V. R. Pk.	25	14	2.57	-.73	Detour	6.03	East Lansing	.90		
Minnesota	58.4	-.1	Winona	98	"2	2 Stations	25	22	1.71	-1.11	Virginia OIMC Lab.	6.00	Artichoke Lake	.09		
Mississippi	75.2	-.6	Eupora	107	"28	Ripley	40	23	1.03	-2.07	Greenville	4.99	6 Stations	.00		
Missouri	71.9	+2.5	2 Stations	105	"28	Hermitage	27	22	1.22	-2.78	Clinton 1NNW	4.00	3 Stations	.00		
Montana	58.1	+2.1	do	98	"11	Wisdom	15	29	.64	.64	Shonkin 7S	2.75	2 Stations	T		
Nebraska	66.5	+2.2	Syracuse	106	28	2 Stations	23	"21	.76	-1.34	Superior	4.35	21 Stations	.00		
Nevada	66.2	+3.4	Overton	111	13	Fish Creek Ranch	22	23	.05	-.37	Wilkins	.57	26 Stations	.00		
New Hampshire	59.5	+1.1	Windham	102	2	Fabyan	20	24	2.06	-1.52	North Stratford	4.70	Blackwater Dam	.91		
New Jersey	67.2	+1.3	Paterson	106	3	Charlotteburg	25	"24	1.49	-2.18	Phillipsburg	5.04	Millville	.22		
New Mexico	66.9	+1.3	Jal	105	27	Eagle Nest	13	27	.17	-1.66	Tularosa	1.83	91 Stations	.00		
New York	61.1	+3	Elmira	107	3	Speculator	20	24	3.35	-.12	Oneonta 1S	7.40	Setauket	.86		
North Carolina	70.4	-1.0	Moncure 2SE	102	1	Celo 2S	28	14	4.97	+.85	Lake Toxaway	11.89	Max Patch Mt.	1.03		
North Dakota	57.6	+5	Grafton State School	93	1	2 Stations	19	21	.88	-.65	Center	2.43	New England	.06		
Ohio	65.8	+2	Philo	107	4	do	29	23	1.49	-1.43	Ashtabula	3.83	Chilo Dam 34	.43		
Oklahoma	76.0	+1.8	9 Stations	108	28	Kenton	38	21	1.54	-1.61	Bartlesville	6.67	4 Stations	.00		
Oregon	61.7	+3.0	John Day	105	11	Seneca	14	26	.56	-.63	Astoria	4.54	19 Stations	.00		
Pennsylvania	63.8	-.2	Stroudsburg	106	3	Hawley 1S Dam	22	"24	3.28	-.12	Pottsville Palo Alto	7.23	Everett 1SW	.55		
Rhode Island	64.3	+1.0	Providence WB AP	99	2	Kingston	29	24	2.83	-.46	Austin	3.42	Kingston	2.49		
South Carolina	73.3	-1.3	2 Stations	100	1	Long Creek 1N	37	14	6.33	+2.15	Ridgeland 2SE	11.96	Ft. Mill 4NW	2.89		
South Dakota	62.3	+7	do	100	1	2 Stations	18	21	.49	-1.06	Sioux Falls WB AP	2.51	3 Stations	.00		
Tennessee	70.8	-.5	5 Stations	104	"1	do	33	23	1.94	-1.23	Sewanee	7.90	2 Stations	.00		
Texas	76.7	+4	Llano	112	28	Spearman	38	21	1.36	-1.53	Blanco	7.37	Numerous Stations	.00		
Utah	64.0	+3.2	St. George CAA AP	103	12	Woodruff	22	25	.11	-.93	Bryce Canyon NP	3.63	30 Stations	.00		
Vermont	58.4	+3	2 Stations	100	3	West Burke	20	24	2.84	-.95	West Danville	5.63	Mays Mill	1.51		
Virginia	68.3	-.1	do	106	"1	Burkes Garden	30	23	2.79	-.48	Cape Henry WB City	8.21	Gordonsville CAA AP	.37		
Washington	60.3	+1.4	Dayton	105	11	Harrington 1N	22	24	1.34	-.30	Forks 1E	7.58	9 Stations	.00		
West Virginia	65.0	-1.1	Morgantown Lock & Dam	106	2	Canaan Valley	22	23	2.00	-.99	Harpers Ferry	4.06	Spruce Knob	.42		
Wisconsin	60.0	+1	Pine River 3NE	102	2	Coddington 1E	21	"13	1.38	-2.34	Lake Mills	3.54	Trempealeau Dam 6	.26		
Wyoming	58.4	+3.2	2 Stations	98	"1	2 Stations	17	25	.37	-.83	Sunshine 4SW	1.57	Armito	.00		
Puerto Rico	78.9	+4	Aguirre (3)	98	"1	Garzas Dam	57	15	8.04	-.44	San Lorenzo (Espino)	19.05	Toabaja (Central Constancia)	2.44		

° Other dates also.



## CLIMATOLOGICAL DATA

Table 2

SEPTEMBER 1953

State and station	Elevation (ground)	Pressure					Temperature										Precipitation										Wind					No. of days (sunrise to sunset)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
		Station	Sea level	Average maximum		Average minimum	Average	Departure from normal		Highest	Date	Lowest	Date	No. of days		Average dew point	Average relative humidity		Total	Departure from normal		No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Speed	Direction	Clear	Partly cloudy	Cloudy	Sky cover / tenths (sunrise to sunset)	Possible sunrise																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
				F	F			F	F					F	F		F	F		F	F	F	F	F	F										F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

See footnotes at end of table.

## CLIMATOLOGICAL DATA

Table 2-Continued

SEPTEMBER 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation										Wind			No. of days							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F or above	Min. 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	Inch or more	With thunderstorms	Snow, Sleet, Hail	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine			
Mb.	Mb.	F	F	F	F	F	F	F	F	F	F	F	In.	In.	In.	No. of days	In.	In.	In.	p. h.	p. h.	0-3	4-7	8-10										
IOWA	Burlington	694	990.5	1016.1	81	53	67.1	+0.4	99	1	36	22	8	0	46	56	1.95	-2.18	1.09	8	7	T	10.1	S	37	SW	29	19	7	4	2.9	9		
	Des Moines	948	984.4	1015.6	81	51	66.2	+0.4	99	28	37	22	4	0	48	54	.66	-2.98	.50	3	3	0	12.2	S	35	NW	11	19	6	5	3.1	8		
	Dubuque	1065	977.3	1016.2	75	49	62.1	-2.9	95	1	33	22	5	0	47	59	1.18	-3.00	.46	6	5	0	0	---	34	SE	11	15	11	4	3.5	--		
	Sioux City	1093	973.2	1014.7	80	49	64.5	+0.1	96	1	35	27	5	0	47	58	1.12	-2.12	.99	4	4	0	0	8.5	ESE	34	SW	2	17	7	6	3.2	89	
KANSAS	Concordia CO <td>1375</td> <td>965.5</td> <td>-----</td> <td>85</td> <td>57</td> <td>71.0</td> <td>+1.5</td> <td>105</td> <td>28</td> <td>46</td> <td>21</td> <td>6</td> <td>0</td> <td>--</td> <td>47</td> <td>1.08</td> <td>-1.38</td> <td>1.07</td> <td>2</td> <td>6</td> <td>.0</td> <td>0</td> <td>7.8</td> <td>---</td> <td>26</td> <td>NW</td> <td>20</td> <td>20</td> <td>8</td> <td>2</td> <td>2.5</td> <td>84</td>	1375	965.5	-----	85	57	71.0	+1.5	105	28	46	21	6	0	--	47	1.08	-1.38	1.07	2	6	.0	0	7.8	---	26	NW	20	20	8	2	2.5	84	
	Dodge City	2594	928.2	1014.4	87	57	72.0	+2.1	98	13	44	21	15	0	--	41	.65	-1.06	.63	3	4	0	0	15.0	S	49	NE	20	22	7	1	2.2	92	
	Goodland	3645	889.3	1014.4	86	48	67.0	+2.0	98	13	31	21	13	1	--	40	.03	-1.34	.03	1	2	0	0	12.4	SSE	40	WNW	28	22	6	2	2.2	--	
	Topeka	879	980.0	1015.2	88	56	71.8	+2.8	104	28	38	22	12	0	--	50	51	-2.77	2.55	2	2	.0	0	10.7	SSE	40	S	5	23	4	3	2.3	89	
	Wichita	1372	966.8	1014.7	89	61	75.1	+3.4	103	28	48	22	15	0	--	47	.53	-2.60	.44	2	2	0	0	15.7	T	35	S	23	22	5	3	2.2	88	
KENTUCKY	Lexington <td>979</td> <td>981.4</td> <td>1016.8</td> <td>84</td> <td>56</td> <td>69.9</td> <td>+1.0</td> <td>101</td> <td>1</td> <td>42</td> <td>22</td> <td>8</td> <td>0</td> <td>--</td> <td>51</td> <td>56</td> <td>1.58</td> <td>-1.25</td> <td>1.09</td> <td>4</td> <td>4</td> <td>.0</td> <td>0</td> <td>9.3</td> <td>SSE</td> <td>---</td> <td>---</td> <td>16</td> <td>11</td> <td>3</td> <td>2.5</td> <td>--</td>	979	981.4	1016.8	84	56	69.9	+1.0	101	1	42	22	8	0	--	51	56	1.58	-1.25	1.09	4	4	.0	0	9.3	SSE	---	---	16	11	3	2.5	--	
	Louisville CO	457	-----	-----	85	61	72.8	+1.7	101	2	48	22	9	0	--	---	.37	-2.32	.27	2	2	.0	0	---	---	---	---	---	---	---	---	---	--	
	Louisville	485	999.3	1015.9	86	55	70.4	+2.2	103	2	43	23	9	0	--	51	57	-2.27	-2.43	.23	3	2	0	0	7.0	S	39	W	12	18	8	4	3.1	80
LOUISIANA	Baton Rouge <td>64</td> <td>1011.9</td> <td>1014.7</td> <td>90</td> <td>66</td> <td>77.9</td> <td>+4.4</td> <td>97</td> <td>28</td> <td>55</td> <td>23</td> <td>21</td> <td>0</td> <td>--</td> <td>64</td> <td>69</td> <td>.09</td> <td>-4.23</td> <td>.07</td> <td>2</td> <td>1</td> <td>.0</td> <td>0</td> <td>6.7</td> <td>N</td> <td>---</td> <td>---</td> <td>17</td> <td>9</td> <td>4</td> <td>3.4</td> <td>--</td>	64	1011.9	1014.7	90	66	77.9	+4.4	97	28	55	23	21	0	--	64	69	.09	-4.23	.07	2	1	.0	0	6.7	N	---	---	17	9	4	3.4	--	
	Lake Charles	12	1013.5	1015.0	75	58	66.3	+7.7	97	21	34	23	17	0	--	66	72	.65	-3.88	.64	2	1	.0	0	5.4	N	---	---	14	10	6	4	2.9	--
	New Orleans CO	9	1012.5	-----	88	73	80.9	+6.5	95	2	44	23	17	0	--	---	2.1	-3.72	1.92	4	2	0	0	6.4	---	22	NE	25	13	11	6	4.1	83	
	New Orleans	3	1012.2	1014.5	89	70	79.2	-3.3	96	28	63	27	17	0	--	67	85	-2.4	-2.82	.16	3	2	0	0	9.1	ENE	*30	WNW	4	19	5	6	3.4	--
	Shreveport	252	1006.4	1015.7	92	64	78.0	-3.0	103	28	50	23	22	0	--	62	64	1.06	-1.16	1.06	2	1	.0	0	6.7	N	---	---	21	3	6	2.7	87	
MAINE	Caribou <td>624</td> <td>991.5</td> <td>1014.7</td> <td>65</td> <td>50</td> <td>54.9</td> <td>+1.7</td> <td>85</td> <td>1</td> <td>27</td> <td>24</td> <td>0</td> <td>2</td> <td>--</td> <td>47</td> <td>78</td> <td>2.35</td> <td>-1.15</td> <td>.99</td> <td>8</td> <td>2</td> <td>.0</td> <td>0</td> <td>11.2</td> <td>S</td> <td>*30</td> <td>S</td> <td>20</td> <td>1</td> <td>12</td> <td>17</td> <td>7.3</td> <td>--</td>	624	991.5	1014.7	65	50	54.9	+1.7	85	1	27	24	0	2	--	47	78	2.35	-1.15	.99	8	2	.0	0	11.2	S	*30	S	20	1	12	17	7.3	--
	Portland	61	1012.2	1016.0	71	47	58.9	+3.7	94	2	28	24	1	1	--	53	82	2.60	-1.48	.95	8	3	.0	0	8.8	SSW	32	S	5	16	5	9	4.7	69
MARYLAND	Baltimore CO <td>14</td> <td>-----</td> <td>-----</td> <td>79</td> <td>62</td> <td>70.4</td> <td>.0</td> <td>98</td> <td>2</td> <td>48</td> <td>24</td> <td>3</td> <td>0</td> <td>--</td> <td>--</td> <td>3.72</td> <td>+2.26</td> <td>2.87</td> <td>7</td> <td>--</td> <td>.0</td> <td>0</td> <td>-----</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>--</td>	14	-----	-----	79	62	70.4	.0	98	2	48	24	3	0	--	--	3.72	+2.26	2.87	7	--	.0	0	-----	---	---	---	---	---	---	---	---	--	
	Baltimore	146	1013.2	1017.8	79	56	67.7	-.9	99	2	40	24	4	0	--	56	70	4.05	+5.59	3.48	5	2	.0	0	10.5	S	37	NW	21	18	3	9	3.5	77
	Frederick	294	-----	-----	79	52	65.8	-2.7	101	2	35	24	6	0	--	--	2.46	-1.10	1.51	5	1	.0	0	-----	---	---	---	---	---	---	---	---	--	
MASSACHUSETTS	Blue Hill Obs.	640	993.5	-----	74	54	63.3	+2.1	99	2	36	24	3	0	--	75	2.77	-1.00	1.18	9	3	.0	0	14.0	SSW	34	SSE	13	14	9	7	4.4	69	
	Boston	12	1013.5	1016.4	75	58	66.3	+2.0	100	2	40	24	1	0	--	54	69	2.55	-1.46	1.04	2	1	.0	0	12.4	SW	33	NW	16	10	10	7	4.1	73
	Barnstable	43	1016.6	1016.9	70	57	63.7	+1.7	82	6	44	24	0	0	--	58	81	4.53	+1.61	1.92	7	2	.0	0	11.5	SSE	54	---	7	13	6	11	5.0	65
	Pittsfield	1153	974.3	1016.3	71	47	59.0	+7.7	95	2	26	24	3	2	--	--	1.99	-2.24	.84	8	1	.0	0	-----	---	---	---	---	---	---	---	---	--	
MICHIGAN	Alpena CO <td>587</td> <td>992.2</td> <td>-----</td> <td>68</td> <td>50</td> <td>58.8</td> <td>+4.4</td> <td>99</td> <td>1</td> <td>36</td> <td>14</td> <td>2</td> <td>0</td> <td>--</td> <td>--</td> <td>5.19</td> <td>+1.99</td> <td>1.86</td> <td>14</td> <td>11</td> <td>.0</td> <td>0</td> <td>10.3</td> <td>---</td> <td>35</td> <td>SE</td> <td>18</td> <td>8</td> <td>13</td> <td>9</td> <td>5.6</td> <td>56</td>	587	992.2	-----	68	50	58.8	+4.4	99	1	36	14	2	0	--	--	5.19	+1.99	1.86	14	11	.0	0	10.3	---	35	SE	18	8	13	9	5.6	56	
	Detroit	619	989.5	1015.8	76	53	64.7	+4.4	100	2	40	14	4	0	--	50	64	1.80	-.98	.93	7	3	.0	0	8.9	NW	38	NW	12	16	8	6	4.0	78
	Escanaba CO	594	991.2	-----	68	50	58.7	+1.3	99	1	36	14	1	0	--	--	1.84	-1.28	.72	10	5	T	T	10.0	---	43	NW	12	16	14	10	6.1	55	
	Grand Rapids	681	990.2	1015.4	76	49	62.1	+2.2	97	1	36	14	4	0	--	49	67	2.55	-.89	1.14	7	7	T	T	9.0	SSW	33	NW	12	10	14	6	4.5	72
	Lansing	859	984.1	1015.9	74	49	61.5	-3.9	96	1	35	14	4	0	--	49	68	1.40	-1.65	.39	11	7	T	T	10.3	WNW	42	NW	12	13	12	5	4.2	71
	Marquette CO	677	986.1	-----	67	49	57.9	+1.1	96	1	40	12	3	0	--	--	3.75	+3.32	1.52	15	4	.0	0	8.8	---	32	N	12	3	14	13	6.4	54	
	Muskogean	627	992.2	1015.4	73	50	61.7	+4.4	95	1	38	14	4	0	--	50	66	2.88	-.46	1.12	11	8	.0	0	-----	---	---	---	12	12	6	4.3	--	
	Sault Ste. Marie	721	991.2	1013.9	64	46	55.0	-2.9	93	1	32	14	2	1	--	49	84	2.97	-.52	1.03	13	7	.0	0	9.4	WNW	31	NW	12	4	13	13	6.6	47
	Ypsilanti	722	987.5	1015.6	77	52	64.2	-.1	100	1	40	14	4	0	--	49	64	1.99	-1.03	1.04	7	5	.0	0	9.2	WNW	*30	WNW	12	13	11	6	4.3	--
MINNESOTA	Duluth <td>1409</td> <td>972.2</td> <td>1013.5</td> <td>64</td> <td>46</td> <td>54.9</td> <td>+1.1</td> <td>86</td> <td>1</td> <td>31</td> <td>13</td> <td>0</td> <td>1</td> <td>--</td> <td>46</td> <td>78</td> <td>.88</td> <td>-2.34</td> <td>.43</td> <td>10</td> <td>6</td> <td>.0</td> <td>0</td> <td>12.3</td> <td>W</td> <td>47</td> <td>W</td> <td>4</td> <td>4</td> <td>14</td> <td>12</td> <td>6.5</td> <td>54</td>	1409	972.2	1013.5	64	46	54.9	+1.1	86	1	31	13	0	1	--	46	78	.88	-2.34	.43	10	6	.0	0	12.3	W	47	W	4	4	14	12	6.5	54
	Intern'l Falls	1179	968.8	1012.7	63	41	51.8	-1.5	79	9	27	13	0	3	--	45	78	3.87	-1.07	2.40	15	6	.0	0	9.1	---	---	---	---	5	10	15	6.8	--
	Minneapolis	830	981.4	1014.5	74	51	62.1	-.1	95	1	37	22	2	0	--	46	60	.55	-2.30	.24	7	2	.0	0	11.1	SSE	39	E	17	16	7	7	4.0	68
	Rochester	1017	977.7	1014.7	74	46	59.9	-.9	93	1	29	22	2	2	--	45	62	.33	-2.72	.16	7	6	.0	0	8.7	SE	---	---	13	11	6	4.4	--	
	St Cloud	1034	975.6	1013.6	72	45	58.5	-3.3	94	2	29	22	2	1	--	46	68	.99	-2.01	.37	6	2	T	T	8.8	NW	---	---	14	11	5	4.6	--	
MISSISSIPPI	Jackson <td>315</td> <td>1003.7</td> <td>1015.4</td> <td>92</td> <td>62</td> <td>77.1</td> <td>+4.4</td> <td>100</td> <td>17</td> <td>52</td> <td>22</td> <td>20</td> <td>0</td> <td>--</td> <td>59</td> <td>60</td> <td>.26</td> <td>-1.84</td> <td>.13</td> <td>3</td> <td>2</td> <td>.0</td> <td>0</td> <td>6.1</td> <td>NE</td> <td>26</td> <td>NE</td> <td>22</td> <td>21</td> <td>7</td> <td>2</td> <td>2.4</td> <td>84</td>	315	1003.7	1015.4	92	62	77.1	+4.4	100	17	52	22	20	0	--	59	60	.26	-1.84	.13	3	2	.0	0	6.1	NE	26	NE	22	21	7	2	2.4	84
	Meridian	294	1001.4	-----	89	61	74.8	-1.1	99	17	51	7	17	0	--	--	1.82	-1.79	1.20	2	2	.0	0	-----	---	---	---	---	---	21	4	5	3.0	--
	Vicksburg CO	234	1006.4	-----	89	66	77.3	+3.3	98	29	49	23	17	0	--	--	.75	-1.02	.75	2	2	.0	0	7.6	---	25	N	5	23	3	4	2.4	89	
MISSOURI	Columbia <td>778</td> <td>987.1</td> <td>1015.4</td> <td>86</td> <td>58</td> <td>71.8</td> <td>+3.1</td> <td>100</td> <td>1</td> <td>43</td> <td>13</td> <td>11</td> <td>0</td> <td>--</td> <td>47</td> <td>48</td> <td>2.72</td> <td>-1.90</td> <td>2.45</td> <td>4</td> <td>2</td> <td>.0</td> <td>0</td> <td>9.8</td> <td>SSE</td> <td>40</td> <td>NW</td> <td>3</td> <td>23</td> <td>5</td> <td>2</td> <td>2.1</td> <td>88</td>	778	987.1	1015.4	86	58	71.8	+3.1	100	1	43	13	11	0	--	47	48	2.72	-1.90	2.45	4	2	.0	0	9.8	SSE	40	NW	3	23	5	2	2.1	88
	Kansas City	741	981.0	1015.3	87	61	74.1	+3.5	103	28	43	22	11	0	--	49	45	1.56	-2.29	1.49	5	3	.0	0	10.3	S	36	S	17	23	4	3	2.2	92
	St. Joseph	809	980.4	1015.0	85	54	69.8	-.1	103	28	36	22	9	0	--	47	47	1.17	-3.12	1.08	2	1	.0	0	10.1	---	35	NW	24	23	5	2	2.1	90
	St. Louis CO	465	995.6	-----	85	62	73.7	+2.3	101	29	49	22	11	0	--	--	.55	-2.83	.31	5	2	.0	0	10.7	---	43	SW	18	20	9	1	2.2	85	
	St. Louis	552	995.6	1016.0	86	52	72.4	+2.0	102	22	42	22	10	0	--	49	47	.40	-3.14	.31	4	3	.0	0	8.6	S	---	---	18	10	1	2.3	81	
	Springfield	1265	969.2	1015.9	88	60	73.7	+4.6	101	28	42	22																						

See footnotes at end of table.



## CLIMATOLOGICAL DATA

Table 2-Continued

SEPTEMBER 1953

State and station	Pressure						Temperature										Precipitation										Wind				No. of days		Possible sunshine
	Elevation (ground)	Station			Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max 90° F or above Min 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days 01 inch or more	Snow, Sleet, Hail	Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)			
		Station	Sea level	Average																													
NEW JERSEY (Cont.)	ft	Mb	Mb	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	In.	In.	In.	In.	In.	In.	M. p. h.	M. p. h.				0-3	4-7	8-10	%			
Newark	11	1015.9	1016.9	79	59	69.0	+2.2	105	2	45	24	3	0	56	67	1.25	-2.64	0.40	8	3	0.0	0	9.3	SSW	*28	NW	21	16	5	9	4.2	7	
Trenton CO	56	1010.2	1016.9	78	58	68.1	+1.1	100	2	44	24	3	0	--	--	1.74	-2.01	.62	10	4	0	0	8.2	---	*25	S	12	16	5	9	4.3	7	
NEW MEXICO																																	
Albuquerque	5310	851.0	1012.9	88	58	73.0	+3.1	93	7	48	29	10	0	30	29	.06	-.99	.06	2	1	.0	0	8.3	SE	38	SE	30	28	2	0	8	95	
Clayton	4969	850.7	1014.9	83	52	67.0	+1.8	91	27	41	21	5	0	--	--	1.17	-1.70	.17	1	4	.0	0	---	---	---	---	26	3	1	1.5	--	--	
Roswell	3612	894.7	1014.3	91	53	72.0	+7	101	26	46	10	19	0	36	32	T	-2.00	T	0	1	.0	0	8.7	---	31	NE	3	25	3	2	1.4	--	
NEW YORK																																	
Albany	277	1012.5	1016.1	74	50	62.1	+5	100	3	30	24	5	1	52	74	2.78	-.37	2.12	7	4	.0	0	8.5	SSE	31	S	30	12	9	9	4.9	65	
Binghamton	1801	958.0	1016.9	71	51	61.0	+1.2	96	3	36	24	4	0	51	73	2.88	-.38	1.04	8	4	.0	0	11.2	S	35	W	13	10	9	11	5.7	62	
Buffalo	693	988.2	1016.1	73	53	63.0	+6	98	3	40	18	4	0	51	69	3.09	+0.08	1.56	9	4	T	0	12.8	S	36	W	13	8	16	6	5.3	58	
New York CO	10	1005.8	---	77	62	69.1	+1.8	99	2	48	14	3	0	--	--	1.61	-2.06	1.00	8	5	.0	0	12.7	---	39	S	12	16	6	8	3.7	75	
New York	19	1015.6	1017.2	78	63	70.3	+1.9	102	2	50	24	3	0	56	64	1.88	-1.67	.78	6	5	.0	0	10.6	S	36	NW	21	17	5	8	4.0	--	
Rochester	543	996.6	1015.8	75	51	63.0	+1.0	99	3	37	24	4	0	52	73	3.35	+.69	1.24	7	4	T	0	9.5	SW	35	W	13	11	14	5	4.7	69	
Schenectady	217	---	---	74	53	63.2	+1.4	97	3	35	24	5	0	--	--	1.65	-1.61	.77	7	3	.0	0	---	---	---	---	22	5	3	3.5	--	--	
Syracuse	399	994.6	1016.5	75	52	63.6	+2	97	4	34	24	4	0	52	69	2.11	-.80	.70	9	3	.0	0	8.3	S	38	S	12	12	10	8	4.8	66	
NORTH CAROLINA																																	
Asheville CO	2203	---	---	79	54	66.4	-1.5	90	1	43	23	1	0	--	--	3.04	+.32	.86	9	3	.0	0	6.6	---	30	SE	19	16	7	7	3.4	73	
Asheville	2093	---	1017.8	---	---	---	---	---	---	---	---	---	---	54	79	---	---	---	---	---	---	---	3.7	NW	---	---	---	---	---	---	---	---	
Charlotte	753	989.8	1017.2	81	61	71.0	-1.6	92	3	49	23	6	0	59	72	3.66	+.01	1.94	9	5	.0	0	6.1	NE	26	SW	12	15	4	11	4.4	74	
Greensboro	891	986.8	1018.3	82	57	69.4	-1.3	96	1	43	14	0	0	57	72	4.12	+.46	1.91	5	2	.0	0	6.6	NE	22	SW	12	18	5	7	3.7	72	
Hatteras	4	1016.3	1016.8	80	71	75.4	+1	86	6	44	24	0	0	67	76	5.07	-1.02	2.92	7	2	.0	0	11.5	NNE	36	SW	27	10	9	11	5.6	61	
Raleigh CO	400	---	---	84	61	72.3	-1.1	94	3	47	23	8	0	--	--	4.12	-.53	3.64	5	2	.0	0	5.6	---	23	SW	12	15	8	7	4.6	67	
Raleigh	138	1002.0	1017.5	83	59	71.3	-1.3	94	3	45	24	10	8	57	69	3.46	-1.03	3.33	5	4	.0	0	6.6	NE	---	---	---	---	---	---	---	---	
Wilmington	30	1015.2	1016.6	83	65	74.0	-1.4	90	17	53	23	2	0	8	91	+2.98	5.54	9	4	.0	0	9.4	---	---	---	---	---	---	---	---	---	---	
Winston-Salem	967	982.7	1017.5	81	59	69.7	-1.2	94	1	46	24	3	0	56	67	3.54	+.05	1.72	6	2	.0	0	7.4	NE	*18	SSW	15	19	4	7	3.4	--	
NORTH DAKOTA																																	
Bismarck	1650	953.6	1013.6	74	44	59.0	+6	92	10	28	21	1	1	43	60	.42	-1.01	.21	6	5	T	T	11.3	WNW	43	E	2	11	10	9	5.1	69	
Devils Lake CO	1471	959.4	---	69	44	56.7	+4	88	9	30	21	0	1	--	--	2.09	+.02	.47	10	5	T	T	8.7	---	29	NW	4	12	10	8	5.1	69	
Fargo	895	979.3	1013.0	72	46	59.0	+1	89	2	32	21	0	1	44	63	.75	-.97	.46	10	4	.0	0	14.1	SSE	42	NW	18	9	11	10	5.5	63	
Williston CO	1877	946.2	1013.7	71	46	58.1	+9	86	7	30	21	0	2	43	60	.46	-.75	.14	5	1	.0	0	7.7	---	35	---	29	9	8	13	5.9	71	
OHIO																																	
Akron	1210	979.3	1017.3	77	51	63.8	-.8	99	3	37	14	6	0	50	68	.94	-2.69	.41	8	4	.0	0	7.0	NW	---	---	---	13	11	6	4.4	--	--
Cincinnati Obs.	761	---	---	83	56	69.9	+1.0	101	2	43	22	8	0	--	--	.72	-2.16	.66	3	1	.0	0	5.1	---	24	---	4	---	---	---	---	---	
Cincinnati	871	985.1	1016.7	83	55	68.6	+1.3	102	2	40	22	7	0	48	53	.75	-2.22	.64	3	0	.0	0	8.2	SSW	---	---	---	14	10	6	4.0	--	--
Cleveland CO	663	---	---	77	57	67.1	+1	98	3	45	23	5	0	--	--	1.25	-1.98	.65	10	---	---	---	---	---	---	---	---	---	---	---	---	---	
Cleveland	787	988.8	1016.3	78	53	65.6	+1	101	3	40	23	5	0	50	63	1.57	-1.56	.56	9	5	.0	0	9.3	S	45	S	4	13	10	7	4.4	66	
Columbus CO	724	---	---	80	58	69.3	+1.5	101	3	45	22	6	0	--	--	.83	-1.73	.27	7	4	.0	0	---	---	---	---	---	---	---	---	---	---	
Columbus	815	987.1	1016.7	80	52	66.2	-1.3	100	2	37	23	6	0	52	65	1.22	-.79	.73	7	4	T	T	6.5	NW	34	S	12	17	8	5	4.0	80	
Dayton	1002	981.0	1016.8	80	55	67.4	+5	99	2	40	22	6	0	50	61	1.49	-1.31	.72	4	2	.0	0	8.5	NW	41	NW	12	16	8	6	4.0	73	
Portsmouth Area CO	715	---	---	83	51	66.9	---	102	2	37	23	7	0	--	--	.81	---	.40	6	2	.0	0	---	---	---	---	---	---	---	---	---	---	
Sandusky CO	603	993.9	---	78	56	66.8	+3	99	1	43	4	5	0	--	--	1.05	-2.21	.38	7	4	.0	0	6.8	---	31	SW	25	16	9	5	3.9	74	
Toledo	621	993.2	1016.2	78	51	64.6	+4	100	2	39	23	5	0	51	67	1.81	-1.21	.89	6	6	.0	0	9.3	SW	38	SW	12	14	11	5	3.9	76	
Youngstown	1178	974.9	1017.1	76	50	63.0	-1.7	96	2	35	23	5	0	50	69	2.35	-1.23	1.05	10	5	T	T	8.4	SW	*33	WNW	7	11	13	6	4.8	--	--
OKLAHOMA																																	
Oklahoma City	1280	969.5	1015.2	90	62	76.0	+2.0	103	28	52	4	18	0	56	55	.99	-2.44	.62	4	5	.0	0	14.1	S	47	NW	3	25	4	1	1.3	94	
Tulsa	672	991.2	1015.1	90	63	76.1	+2.3	102	28	49	22	19	0	54	52	1.85	-2.40	1.32	2	3	.0	0	11.1	S	38	NW	3	25	4	1	1.6	92	
OREGON																																	
Astoria	12	1016.9																															

## CLIMATOLOGICAL DATA

Table 2—Continued

SEPTEMBER 1953

State and station	Elevation (ground)	Pressure			Temperature										Precipitation										Wind			No. of days					
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. 90° F or above	No. 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days	Snow, Sleet, Hail	Max depth on ground	Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine		
	ft.	Mb.	Mb.	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F
TEXAS																																	
Abilene	1752	954.6	1014.4	93	65	78.5	+3.0	105	27	53	5	22	0	52	45	1.24	-1.36	0.86	4	2	T	0	9.7	S	36	18	22	3	5	2.2	86		
Amarillo	3590	891.0	1014.0	89	56	72.8	+3.5	98	27	46	21	18	0	44	41	.26	-2.02	.25	2	2	0	0	11.8	SW	42	20	26	3	1	1.3	93		
Austin	615	994.2	1015.8	92	65	78.5	-.8	103	27	56	24	21	0	62	62	2.98	-1.08	2.23	5	1	0	0	6.8	S	34	2	19	3	8	3.3	79		
Big Spring	2569	927.9	1014.2	93	64	78.5	+2.3	103	27	59	22	22	0	46	37	.23	-1.70	.23	1	1	0	0	12.5	S	*30	2	25	2	3	1.6	82		
Brownsville	15	1011.9	1014.0	91	71	81.0	-.4	98	28	65	24	20	0	70	74	.50	-5.77	.36	4	2	0	0	10.3	NW	31	SE	2	16	6	3.7	82		
Corpus Christi	40	1013.9	1014.9	91	70	80.8	-.6	99	16	66	6	20	0	69	73	.78	-3.92	.48	2	3	0	0	9.1	E	35	N	4	20	6	4	3.0	90	
Dallas	487	997.3	1015.5	94	65	79.4	+5.0	105	28	55	24	22	0	59	54	.93	-1.78	.64	3	2	0	0	7.4	SE	42	SW	2	22	5	3	2.0	90	
Del Rio	1091	980.7	1014.5	91	66	78.6	-1.2	102	27	61	6	19	0	58	56	4.55	+2.04	3.87	5	3	0	0	4.3	SE	27	NW	3	22	1	7	2.6	77	
El Paso	3920	883.2	1013.0	91	62	76.3	+1.4	96	19	57	13	20	0	37	26	T	1.13	T	0	1	0	0	9.7	S	35	E	30	27	3	0	.7	98	
Fort Worth	544	994.9	1015.4	93	65	79.1	+9.0	105	28	56	24	21	0	55	49	1.68	-1.01	1.67	3	3	0	0	9.2	S	*30	S	2	21	5	4	2.0	--	
Galveston CO	7	-----	-----	87	75	80.9	+6.6	94	21	65	23	7	0	69	72	.56	-4.88	.38	2	1	0	0	9.9	NE	35	NW	4	19	6	5	3.2	--	
Galveston	5	1014.6	1015.3	87	74	80.5	+1.1	93	21	64	23	4	0	69	72	.28	-5.54	.14	5	1	0	0	9.8	NE	-----	-----	19	6	5	3.2	--		
Houston CO	41	1009.8	-----	87	71	80.6	+6.6	96	27	59	23	18	0	65	67	.34	-3.31	.30	4	0	0	0	8.0	NE	25	N	4	18	7	5	3.3	85	
Houston	50	1012.5	1015.0	91	68	79.4	+7.7	97	20	58	23	20	0	65	67	.14	-4.21	.14	1	0	0	0	7.6	NNE	-----	-----	19	6	5	3.2	--		
Laredo	500	999.3	1014.3	94	71	82.4	-1.1	103	27	63	24	27	0	64	59	2.96	-.20	2.80	3	3	0	0	10.1	SE	-----	-----	19	6	5	3.2	--		
Lubbock	3243	904.8	1014.3	89	55	72.1	+9.0	107	27	49	4	17	0	45	44	.04	-2.81	.04	1	1	0	0	11.9	S	*45	N	18	24	4	2	1.5	--	
Port Arthur	16	1014.2	1015.1	90	68	78.9	+1.0	96	13	53	23	18	0	67	74	.50	-4.38	.50	1	1	0	0	8.3	NNE	32	NW	4	18	9	3	3.1	84	
San Angelo	1903	948.9	1014.7	91	63	77.4	+9.0	104	27	55	5	19	0	52	46	1.24	-1.06	.87	3	1	T	0	7.7	S	27	NW	12	18	6	6	3.3	79	
San Antonio	782	991.2	1015.1	91	66	78.3	-1.1	101	27	57	24	16	0	60	59	2.48	-.89	1.59	4	2	0	0	5.2	NNW	28	SE	1	19	2	9	3.3	83	
Victoria	109	1010.5	1014.9	91	69	80.0	-.8	99	27	59	23	19	0	66	66	.85	-2.84	.45	4	3	0	0	6.6	NE	135	NNE	4	17	6	7	3.5	--	
Waco	504	997.0	1015.0	92	65	78.6	-.3	103	27	58	24	21	0	60	57	1.65	-1.32	.90	3	2	0	0	6.5	S	-----	-----	20	3	7	2.9	--		
Wichita Falls	1027	978.3	1014.4	94	65	79.3	+2.9	106	28	54	4	25	0	52	44	.37	-2.35	.36	2	2	0	0	9.6	W	*33	S	2	26	2	2	1.2	--	
UTAH																																	
Milford	5028	848.3	1015.6	87	45	65.6	+3.0	93	12	33	25	0	0	-----	-----	T	-.40	T	0	2	0	0	9.7	SE	30	S	21	21	1	2.7	--		
Salt Lake City	4222	868.9	1014.7	84	53	68.2	+4.0	94	12	43	24	5	0	38	37	.13	-.61	.07	2	3	0	0	9.7	SE	30	S	21	21	1	2.5	87		
VERMONT																																	
Burlington	331	1001.0	1015.4	71	50	60.3	+4.4	90	4	31	24	3	1	51	74	1.52	-1.62	.64	11	2	0	0	9.6	S	34	S	19	3	17	10	6.2	48	
VIRGINIA																																	
Lynchburg	947	984.1	1018.1	81	56	68.5	-.3	98	1	42	14	5	0	55	67	3.11	+0.01	2.40	7	2	T	0	7.6	S	29	S	14	18	3	9	3.6	79	
Norfolk	25	1016.6	1017.6	80	63	71.8	-.2	93	3	52	24	3	0	62	75	4.17	+0.31	2.73	10	3	0	0	8.3	S	28	NE	27	18	6	6	4.0	84	
Richmond	160	1011.9	1017.8	82	58	70.0	-.3	102	1	44	14	5	0	58	72	6.84	+3.19	3.14	7	2	0	0	7.7	S	27	NW	12	18	6	6	3.3	79	
Roanoke	1174	976.3	1017.9	82	55	68.8	-.3	101	1	41	14	8	0	52	63	1.47	-1.92	.63	7	2	T	0	6.5	SE	-----	-----	17	5	8	3.8	--		
Washington CO	72	-----	-----	81	60	70.6	+7.0	102	1	45	24	5	0	-----	-----	4.60	+2.44	4.05	5	2	0	0	6.2	NE	26	NW	21	19	3	8	3.4	--	
Wash. Nat'l AP	14	1012.9	1017.2	80	60	69.7	+1.1	100	2	46	24	5	0	56	66	4.07	-.05	3.63	5	2	0	0	9.1	S	35	N	21	19	3	8	3.4	75	
WASHINGTON																																	
Olympia	190	1009.8	1017.2	72	44	58.2	+1.1	88	5	33	24	0	0	50	76	2.68	+8.88	1.40	8	0	0	0	4.1	SSW	*25	WSW	28	10	9	11	5.4	--	
Seattle CO	14	-----	-----	70	54	62.1	+1.1	86	4	46	25	0	0	-----	-----	2.85	+1.29	1.91	7	1	0	0	8.3	-----	42	S	27	11	8	11	5.6	57	
Seattle	14	1016.4	1017.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	52	73	-----	-----	-----	-----	-----	-----	7.0	SSE	-----	-----	-----	-----	9	13	5.7	--		
Seattle-Tacoma	379	1003.4	1017.8	70	50	59.7	+1.0	86	5	40	24	0	0	51	75	3.28	+1.63	1.77	10	1	T	0	8.9	NE	-----	-----	9	13	5.7	--			
Spokane	2357	947.2	1016.0	75	48	61.7	+2.5	92	11	37	24	1	0	40	48	.50	-.43	.28	5	0	0	0	7.6	SW	34	SW	28	12	12	6	4.5	82	
Tatoosh CO	101	1013.5	1017.2	62	52	55.1	+1.6	70	4	47	30	0	0	53	89	4.53	+8.99	1.70	11	2	0	0	12.3	S	61	S	27	7	4	19	7.0	51	
Walla Walla CO	949	980.1	1015.2	82	56	68.9	+3.6	94	11	44	24	10	0	-----	-----	.17	-.69	.21	2	0	0	0	5.5	-----	26	W	28	16	10	4	3.4	87	
Walla Walla	1200	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	42	-----	-----	-----	-----	-----	-----	-----	7.6	E	-----	-----	-----	-----	12	11	7	4.2	--	
Yakima	1061	976.6	1015.4	80	43	61.6	+5.5	93	11	33	24	5	0	43	54	T	-.39	T	0	0	0	0	8.0	NNW	-----	-----	12	11	7	4.2	--		
WEST VIRGINIA																																	



# HEATING DEGREE DAYS

(Base 65°F.)

SEPTEMBER 1953

Table 3

State and station	Current season		Normals July through this month	State and station	Current season		Normals July through this month	State and station	Current season		Normals July through this month	State and station	Current season		Normals July through this month
	This month	Period July through this month			This month	Period July through this month			This month	Period July through this month			This month	Period July through this month	
ALABAMA				INDIANA (Cont'd.)				NEVADA (Cont'd.)				TENNESSEE (Cont'd.)			
Birmingham	1	1	13	Indianapolis	55	56	79	Winnemucca	100	154	197	Chattanooga	11	11	24
Mobile	0	0	0	South Bend	123	135	119					Knoxville	6	6	33
Montgomery (CO)	0	0	0	Terre Haute	54	54	82	NEW HAMPSHIRE				Memphis	1	1	17
Montgomery	0	0	0					Concord	190	256	260	Nashville	6	6	22
				IOWA				Mt. Washington	745	1801					
ARIZONA				Burlington	68	69	83					TEXAS			
Flagstaff	212	318	370	Charles City (CO)	104	112	198					Abilene	0	0	5
Phoenix (CO)	0	0	0	Des Moines	66	66	116	NEW JERSEY				Amarillo	12	12	37
Phoenix	0	0	0	Dubuque	150	156	185	Atlantic City (CO)	26	26	29	Austin	0	0	0
Prescott	5	6	34	Sioux City	91	93	153	Newark	45	45	47	Big Spring	0	0	0
Tucson	0	0	0					Trenton (CO)	54	54	55	Brownsville	0	0	0
Tucson	0	0	0	KANSAS								Corpus Christi	0	0	0
Winslow	3	3	20	Concordia	15	15	55	NEW MEXICO				Dallas	0	0	0
Yuma	0	0	0	Dodge City	16	18	40	Albuquerque	0	0	10	Del Rio	0	0	0
				Goodland	59	61	95	Clayton	32	33	68	El Paso	0	0	0
ARKANSAS				Topeka (CO)	14	14	42	Roswell	0	0	8	Ft. Worth	0	0	0
Ft. Smith	4	4	9	Topeka	19	19	67	NEW YORK				Galveston (CO)	0	0	0
Little Rock	0	0	10	Wichita	9	10	32	Albany	165	192	163	Galveston	0	0	0
Texarkana	0	0	0					Binghamton	190	257	271	Houston (CO)	0	0	0
				KENTUCKY				Buffalo	137	154	168	Houston	0	0	0
CALIFORNIA				Lexington	27	27	56	New York (CO)	39	39	39	Laredo	0	0	0
Bakersfield	0	0	0	Louisville (CO)	12	12	41	La Guardia Field	29	29	28	Lubbock	4	4	23
Bishop	11	15	55	Louisville	21	21	51	Rochester	152	184	176	Port Arthur	0	0	0
Blue Canyon	63	184	182	Pikeville (CO)	13	13		Schenectady	132	139		San Angelo	0	0	0
Burbank	4	4	11					Syracuse	134	162	146	San Antonio	0	0	0
Eureka (CO)	195	680	779	LOUISIANA								Victoria	0	0	0
Fresno	0	0	0	Baton Rouge	0	0	0	NORTH CAROLINA				Waco	0	0	0
Los Angeles (CO)	2	2	17	Lake Charles	0	0	0	Asheville (CO)	51	51	50	Wichita Falls	0	0	5
Los Angeles	29	30	109	New Orleans (CO)	0	0	0	Asheville	95	100					
Mt. Shasta (CO)	71	165	248	New Orleans	0	0	0	Charlotte	13	13	7	UTAH			
Oakland	32	158	237	Int. Airport, Moisant	0	0	0	Greensboro	24	24	29	Midford	32	36	114
Red Bluff	0	5	0	Shreveport	0	0	0	Hattiesburg (CO)	0	0	0	Salt Lake City (CO)	11	11	61
Sacramento (CO)	0	5	17					Raleigh (CO)	7	7	10	Salt Lake City	28	28	88
Sacramento	0	4	22	MAINE				Raleigh	11	11	16				
Sandberg (CO)	34	74	26	Caribou	315	549	572	Wilmington	3	3	0	VERMONT			
San Diego	3	3	42	Greenville (CO)	294	464		Winston-Salem	22	22	28	Burlington	199	256	238
San Francisco (CO)	88	481	476	Portland	226	313	270								
San Francisco	50	281	381					NORTH DAKOTA				VIRGINIA			
San Jose	12	31	44	MARYLAND				Bismarck	205	226	293	Lynchburg	40	40	49
Santa Maria	78	262	303	Baltimore (CO)	28	28	29	Devils Lake (CO)	266	321	384	Norfolk	7	7	9
				Baltimore	58	58	43	Fargo	214	238	281	Richmond	28	28	33
COLORADO				Frederick	84	85	47	Grand Forks	265	308		Roanoke	38	38	50
Alamosa	294	416	494	MASSACHUSETTS				Pembina	239	290					
Colorado Springs	71	104	153	Boston	71	75	84	Williston (CO)	220	251	332	WASHINGTON			
Denver	47	47	136	Milton	125	166						Olympia	201	385	381
Grand Junction	2	2	36	Nantucket	93	141	167	OHIO				Seattle (CO)	104	162	228
Pueblo	29	30	74	Pittsfield	228	344	301	Akron	124	145	100	Seattle	158	339	337
								Cincinnati (CO)	16	16	42	Spokane	149	204	250
CONNECTICUT				Pittsfield	228	344	301	Cincinnati	44	44	63	Tatoosh Island (CO)	258	776	898
Bridgeport	53	54	66	MICHIGAN				Cleveland (CO)	76	79	69	Walla Walla (CO)	36	39	93
Hartford	99	109	115	Alpena (CO)	237	297	350	Cleveland	92	97	85	Yakima	142	176	157
New Haven	80	93	111	Detroit	102	108	104	Columbus	75	78	77				
				Escanaba (CO)	222	269	404	Dayton	63	63	79	WEST VIRGINIA			
DELAWARE				Grand Rapids (CO)	118	122	125	Sandusky (CO)	71	71	66	Charleston	49	50	60
Wilmington	53	53	47	Grand Rapids	161	178	187	Toledo	109	113	114	Elkins	159	201	162
				Lansing	169	197	186	Youngstown	141	175	102	Huntington (CO)	33	33	35
DIST. OF COLUMBIA				Marquette (CO)	253	343	392					Parkersburg (CO)	50	50	56
Washington (CO)	28	28	32	Muskegon	166	195	226	OKLAHOMA				Petersburg (CO)	83	86	77
Washington	30	30	37	Sault Ste. Marie	333	496	533	Oklahoma City (CO)	0	5	12				
				Ypsilanti	108	114		Oklahoma City	0	5	14	WISCONSIN			
FLORIDA								Tulsa	1	3	18	Green Bay	203	231	273
Apalachicola (CO)	0	0	0	MINNESOTA								La Crosse	129	130	183
Daytona Beach	0	0	0	Duluth (CO)	309	438	434	OREGON				Madison (CO)	136	140	177
Fort Myers	0	0	0	Duluth	313	415	445	Astoria	168	322		Madison	143	146	194
Jacksonville (CO)	0	0	0	International Falls	390	509	544	Burns (CO)	136	206	266	Milwaukee (CO)	93	98	147
Jacksonville	0	0	0	Minneapolis	139	144	182	Eugene	101	181	211	Milwaukee	123	125	186
Key West (CO)	0	0	0	Rochester	199	218	244	Meacham	198	451	484				
Key West	0	0	0	St. Cloud	227	254	310	Medford	40	65	77	WYOMING			
Melbourne	0	0	0					Pendleton	65	80	104	Casper	124	138	268
Miami (CO)	0	0	0	MISSISSIPPI				Portland (CO)	60	95	112	Cheyenne	139	173	313
Int. Airport, Hialeah	0	0	0	Jackson	0	0	0	Portland	91	164	163	Lander	120	135	274
Miami Beach	0	0	0	Meridian	0	0	0	Roseburg	69	108		Rock Springs (CO)	147	157	
Orlando	0	0	0	Vicksburg (CO)	1	1	0	Salem	94	190	157	Rock Springs	148	170	318
Pensacola (CO)	0	0	0					Sexton Summit (CO)	137	406	326	Sheridan	139	151	307
Tallahassee	0	0	0	MISSOURI											
Tampa	0	0	0	Columbia	25	25	68	PENNSYLVANIA							
West Palm Beach	0	0	0	Kansas City	13	13	44	Allentown	91	98	98				
				St. Joseph	27	27	54	Harrisburg	66	66	69				
GEORGIA				St. Louis (CO)	10	10	38	Park Place (CO)	194	236	244				
Albany	0	0	0	St. Louis	19	19	45	Philadelphia (CO)	29	29	33				
Athens	10	10	5	Springfield	13	13	69	Philadelphia	44	44	47				
Atlanta (CO)	11	11	8					Pittsburgh (CO)	57	57	56				
Atlanta	10	10	8	MONTANA				Pittsburgh	111	124	114				
Augusta	0	0	0	Billings	112	119	222	Reading (CO)	53	53	62				
Columbus	0	0	0	Glasgow (CO)	177	179	288	Scranton (CO)	117	137	133				
Macon	0	0	0	Great Falls	155	193	347	Williamsport	111	120	117				
Rome	0	8	8	Havre (CO)	168	193	328								
Savannah	0	0	0	Helena	184	230	422	RHODE ISLAND							
Valdosta	0	0	0	Kalispell	248	406	456	Block Island	60	73	115				
				Miles City	138	141	204	Providence	118	134	133				
IDAHO				Missoula	175	264	371								
Boise	78	94	135	NEBRASKA				SOUTH CAROLINA							
Lewiston	62	80	133	Grand Island	62	63	90	Charleston (CO)	0	0	0				
Pocatello	87	88	183	Lincoln (CO)	39	39	86	Charleston	0	0	0				

# SEVERE STORMS

Table 4

SEPTEMBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Cut Bank (north and west of), Glacier County, Mont.	1	Early after- noon	* $\frac{1}{2}$ to 1	12				\$7,500	Hail	Damage to barley and wheat.
Danvers, Fergus County, Mont.	1	6 p.m.	*1	6				500	do	
Sundance, Wyo.	1				1				Electri- cal	Rancher killed in field when struck by lightning.
Arcola, Loudon County, Va.	2	Early a.m.							Wind	Barn demolished. Slight damage to airplanes.
Toby Creek area from Dallas to Kingston, Pa.	2	Afternoon					Thousands		Electri- cal, wind, and rain	Violent high winds, referred to by papers as "twister", attended thunderstorm which moved from north-west down Toby Creek Valley. Trees uprooted; utility lines downed; highways and fields littered with branches; awnings ripped; homes and cars damaged by fallen trees; windows blown in. Rains caused flooding of low spots and water damage through broken windows. 100-feet of fence at outdoor theater destroyed, and lawn chairs blown away.
London and vicinity, Madison County, Ohio	3	4 p.m.					Several thou- sand	Several hundred	Wind, hail, and electri- cal	Barns blown down, roofs of many buildings torn off, hundreds of large trees uprooted and hail stripped corn stalks of all but the ears and blown crossways of rows making power machinery harvesting impossible. Power lines downed and telephone services disrupted. Straw stack struck by lightning and destroyed by fire.
Connecticut, central portion	3	Late af- ternoon					\$3,000		Wind	Thunderstorm occurred over State, with strong winds reported in towns of Manchester, Middletown, Middlefield, Portland, Marlborough, Gilead, Hebron, and Colchester. Trees and branches blown down in these communities, breaking utility lines and blocking traffic. In Manchester, a house unroofed and an automobile damaged by downed tree. Other property losses consisted of minor damage to chimneys and TV antennae.
Canaan Mt., Litchfield County, Conn.	3	Late af- ternoon			1		5,000		Electri- cal	Woman killed by lightning. Buildings damaged in North Norfolk.
Niagara County, N. Y.	4	Afternoon			1				Electri- cal and wind	High winds and lightning disrupted utility services generally. Trees and power lines blown down while some fruit blown from trees. Death caused by lightning; 2 barns burned, 1 at Middleport with an estimated loss of \$10,000.
Cornelius (3 miles west of), Mecklen- burg Coun- ty, N. C.	5	6 p.m.						5,000	Hail	
Medford to Klamath Falls, Ore.	5	Evening	*Sev- eral	Many			10,000	50,000	Winds, electri- cal, rain, and hail	A very severe, or series of very severe, thunderstorms accompanied in many areas by heavy hail moved across very wide path. At Medford peak of storm reached between 6:30 and 7 p.m. High winds also accompanied storm in many areas. More than 20 forest fires started by lightning; 1 house struck; winds and hail damaged an estimated \$50,000 worth of late pears in Medford area. In excess of \$5,000 worth of damage caused to outdoor carnival operating in Medford. Some basements flooded in both Medford and Ashland by deluge of rain that occurred at peak of storm. Extensive and fairly costly power outages caused in both Jackson and Klamath Counties.
St. Louis County, Mo.	6	4 p.m.					12,000		Wind	Gusts estimated at 80 m.p.h. in local thundersquall blew down small hangar, demolished 3 light planes, and damaged a few other planes at Weiss Airport.
Cape Cod area, Mass., and Maine Coast	7	All day					1,070,000		do	Hurricane CAROL travelled northward east of New England, producing heavy seas and gales along southeastern Massachusetts and Maine shores. 3,500 ton freighter grounded near Provincetown, Mass., later refloated; damage unreported but apparently minor. Fishing craft wrecked near Gloucester, Mass.: \$50,000 loss. Power yacht foundered off Massachusetts Coast: \$20,000 loss. Maine Fisheries Commissioner estimated State's fishermen lost \$1,000,000 worth of gear, mostly lobster traps, in storm.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

SEPTEMBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Springfield, Ill.	7	2:30 p.m.					\$1,000		Wind	Strong thunderstorm winds damaged a number of boats on Lake Springfield.
Springfield, Ill.	7	9:30 p.m.					5,000		do	Very local thunderstorm damaged parked airplanes.
Bryce Canyon National Park, Utah	9	11:10 a.m.- 12:30 p.m.							Electri- cal and rain	4 horses and 1 steer killed by lightning. Total amount of precipitation 3.36 inches.
Kalamazoo, Kalamazoo County, Mich.	11	4:45 a.m.					22,000		Electri- cal	Barn and contents burned.
Hopkins, Allegan County, Mich.	11	A.m.					6,000		do	Corncrib and barn destroyed by fire.
Dowagiac (near), Cass Coun- ty, Mich.	11						4,000		do	Barn burned.
Wisconsin, southern portion	11	1-4 p.m.					50,000	\$50,000	Electri- cal, hail, and wind	Storm moved southeastward, south of line from La Crosse to Racine but skipped over many communities. Hail riddled many fields of crops and was ankle deep in places. Stones ranged up to golf-ball size. High winds felled many trees, disrupted utility lines, and damaged buildings.
Milwaukee, Wis.	11	4:50 p.m.			1	1			Electri- cal	Lightning struck 2 men, killing 1.
Warsaw, Ind.	11-12	9:50 p.m.- 3 a.m.					8,000		Wind	Cave-in of new building. Several trees, and many tree limbs down, a few fell on tops of automobiles. Television antennae toppled over.
Van Wert and vicinity, Van Wert County, Ohio	11	10-12 p.m.					Several thou- sands	Several thou- sands	Wind and hail	Most damage from broken show windows and tree branches on utility lines. Many TV antennae damaged from strong winds. Largest hail ½ inch.
Columbus, Ohio	11 and 12	10 p.m.- 3 a.m.				1	Several thou- sand		Wind and electri- cal	Winds reached 46 m.p.h. Trees and power and tele- phone lines blown down. Several trees fell on parked cars and across road intersections. Light- ning struck home causing \$11,000 fire loss. 1 person injured in automobile accident.
Columbia City, Ind.	11	10:12 p.m.				2	5,000		Wind	Principal damage to 2 buildings. Part of roof torn off 1 building, damage to another; 2 persons in- jured by falling debris. Also small section of roof of house damaged. Streets littered with small tree limbs. Several large trees damaged or blown down. Some damage to television aerials.
Portland, Ind.	11	11 p.m.					10,000		do	Damage to 72 television antennae, \$4,100; power lines, \$3,000. Damage also to roofs by falling an- tennae and limbs of trees. Small fire started by fallen lines.
Hardin Coun- ty, Ohio	12	Shortly after midnight				1	Several thou- sand	Several thou- sand	do	Power and telephone lines damaged, trees blown down, utility poles broken off, chimney and TV aerials blown down, and several automobiles damaged by falling trees.
Shelter Bay, Alger Coun- ty, Mich.	12	5 a.m.- midnight							do.	12 cabin cruisers foundered or beached.
Marquette (6 miles east of), Mar- quette County, Mich.	12	9:50 a.m.							do	<u>U.S.S. Maryland</u> went aground from sudden windstorm on Lake Superior.
Concord, Cabarrus County, N. C.	12	6-7:30 p.m.					20,000		Electri- cal and wind	Lightning-set fire destroyed dwelling; also, damaged power facilities. Accompanying wind damaged sev- eral roofs.
Klingers- town, Pa.	12	6:30-7 p.m.		5	0	0	4,000		Tornado	Tornado moving from northwest in hit-skip fashion unroofed several barns and sheds, demolished a gar- age, and damaged a car; also, damaged utility lines with power out for 4½ hours.

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

SEPTEMBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Statesville, Iredell County, N. C.	12	7:30 p.m.					\$10,000		Wind	Severe thunderstorm winds estimated up to 70 m.p.h. blew down a number of trees within city, blew off portions of several warehouse roofs, and broke 1 plate-glass store window.
Dunnsville, Essex Coun- ty, Va.	13	Late p.m.					40,000		Electri- cal	Historic residence destroyed.
Tappahan- nock, Va.	13	Night					2,400		do	12 cows killed.
Westerly, Pawcatuck, and Salt Pond area of Narra- gansett and South Kings- town, R. I.	16	Morning					10,000		Wind	Violent thunderstorm winds damaged buildings, downed trees and power lines, and damaged about 6 small boats in Salt Pond.
Boulder, Colo.	17	2:05-2:06 p.m.	10	20	0	0	3,000	\$0	Tornado	A tornado-type wind of limited intensity and duration occurred in southwest portion of city, a residential section. Damage limited to 2 residences.
Arkansas County, Ark.	18	6-7 p.m.					Slight	Consider- able	Wind	Considerable heavy rice blown down. Damage wide- spread.
Deaf Smith and Castro Counties, Tex.	18								Hail	
Halfway and Hale Cen- ter, Hale County, Tex.	18	7 p.m.	*4	20				750,000	do	Cotton damage ranged from 50 to 100 percent and esti- mated in excess of 5,000 bales. Hail reported drift- ed in places to depth of a foot or more.
El Reno (5 miles south of), Okla.	18	7-7:05 p.m.	440	½			500		Wind	Believed to be a severe local line squall over limited area rather than tornado because of lack of evidence of twisting action, and reported as having occurred after wind had shifted. Damage to telegraph lines; also minor damage on 1 farmstead.
Charlotte, Eaton Coun- ty, Mich.	18						2,000		Electri- cal	2 barns struck; fires started.
Tavernier, Fla.	19	Late af- ternoon			0	0	0	0	Water- spouts	3 waterspouts near Tavernier dissipated without reach- ing land.
Miami Air- port (10 miles northeast of), Fla.	20	1 p.m.			0	0	0	0	Tornado	Funnel cloud existed about 15 minutes and reached ground part of time.
Flagler Beach (7 miles northeast of), Fla.	20	3:30 p.m.			0	0	0	0	Water- spout	Occurred under dark thundercloud. Dissipated after several minutes without reaching land. Extended from cloud to sea.
Petoskey (near), Emmet Coun- ty, Mich.	20	P.m.			0	0	0	0	Tornado, rain, wind, and hail	A short-lived tornado cloud seen northwest of Petoskey, traveling northeastward behind rain squall. High wind damaged a few trees. Some hail accompanied storm.
Henryetta and vicini- ty, Okla.	20	Night					20,000		Hail	An estimated 1,000 claims for insurance -- minor losses to roofs, and windows.
Shawnee, Pottawa- tomie Coun- ty, Okla.	21	1:51 a.m.							Electri- cal	Lightning set fire to lumberyard, resulting loss by fire estimated at \$125,000. 2 dairy cows killed by lightning.
Melbourne (5 miles northwest of), Fla.	22	12:45- 12:55 p.m.	200	1	0	0	0	0	Tornado	Formed under small cumulonimbus cloud and moved west- ward over flooded marsh land.
Brunswick, Ga.	23-26						1,000	Light	Rain, wind, and tide	Strong northeast winds intensified tidal rise on 23d, causing flooding in harbor and surrounding areas; many city blocks affected. This condition continued several days by very heavy to excessive rains of 24- 26th. Damages moderate, mostly to yards and business house fronts. Transportation and outside work great- ly curtailed.

See footnotes at end of table.



## SEVERE STORMS

Table 4--Continued

SEPTEMBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
St. Simons Island and southeast coast, Ga.	23-26					Sev- er- al	\$15,000		Rain, wind, and tide	Strong northeast winds, especially at times of high tides, caused unusually high tides and damaging waves. Causeways inundated and broken in places, number of beach homes undermined to settle dangerously from already weakened foundations, and 1 expensive home sustained heavy damages. Several persons injured in attempting to hold bulkheads against rising sea. Very heavy rains added further to force of sea.
Arkansas City (4 miles west of), Cowley County, Kans.	24	Early a.m.					20,000		Electri- cal	Fire and explosion at oil drilling rig.
Bellwood, Blair Coun- ty, Pa.	24	7:40 a.m.			1	3			Fog	Dense fog, with visibility reported about 10 feet. Automobile struck loading school bus and tractor trailer struck both and burned. 30 children in school bus shaken up and bruised.
Florida, northwest portion	26	Morning	50	100			125,000	\$40,000	Hurricane	Center of hurricane reached coast between Fort Walton and Panama City, about 8 a.m., accompanied by hurricane-force winds. Winds diminished considerably as storm moved north-northeastward across northwest portion of Florida.
Alabama, southeast- ern portion	26						160,500	3,002,000	do	Tropical hurricane "Florence" moved inland between Fort Walton and Panama City, Fla., during morning of September 26 and was centered just east of Fort Walton at 10 a.m. Center of storm passed near Dothan, Ala., during 26th and was centered northeast of Albany, Ga., on morning of 27th. Winds of 30 to 40 m.p.h., with gusts up to 50 or 60 m.p.h., accompanied storm after it moved inland. Many stations in southeastern and east-central Alabama reported 24-hour rainfalls of 8 to 11 inches on 26th. Flash floods in small streams and creeks occurred on 26th and 27th.
Elk Mound (near), Dunn Coun- ty, Wis.	26	Morning			2	1			Electri- cal	2 persons killed.
Kenosha, Wis.	26	6:25 p.m.					25,000		Electri- cal and wind	High winds felled trees and disrupted utility lines. Several transformers burned out by lightning. Buildings damaged by wind.
Schuyler, Fulton, Knox, Peoria, Stark, Marshall, Putnam, and La Salle Counties, Ill.	26	7 p.m.					2,000,000		Wind and hail	At about same time, severe thunderstorms developed at a number of local points in north-central Illinois. Most of damage due to strong winds which blew down small building, trees, television antennae, and power and telephone lines. Hail accompanied some thunderstorms, but was not as general as strong winds.
Acme, Grand Traverse County, Mich.	26	P.m.					2,000		do	50 trees and many utility poles downed; 20 houses damaged; small boats blown ashore. Some hail accompanied storm.
Rosebush (6 miles north- east of), Isabella County, Mich.	26	8-9 p.m.					15,000		Electri- cal	Barn burned.
Washington western portion	27	Afternoon and night					Several thou- sand		Wind	1 fishing boat sank near Port Townsend, another sank a few miles beyond Tatoosh Island. Several pleasure boats damaged in Puget Sound and Lake Washington. Power lines damaged in vicinity of Seattle. Some damage to timber over Olympic Peninsula.
West Gla- cier, Flat- head Coun- ty, Mont.	27-29								do	High wind on night of 27th, and during day of 28th and 29th caused considerable damage to forests by blowing down trees. Some roads blocked by fallen timber.
Cheyenne, Wyo.	28	Afternoon						Light	do	Truck damaged when wind blew tree across cab. Several television antennae blown down.

See footnotes at end of table.

# SEVERE STORMS

Table 4—Continued

SEPTEMBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Seymour (3 miles north of), Wis.	29	Evening					\$10,000		Wind	Several farm buildings damaged.
Newaygo (near), Newaygo County, Mich.	29	8-10 p.m.					7,000		Electri- cal	House burned.

- \* Miles instead of yards.
- Crop damage included with other property damage.



# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

## SEPTEMBER 1953

Streams remained at low levels throughout most of the month. Several record-low stages were reached throughout the eastern two-thirds of the Country. There were no major or significant floods during the month.

The heavy rains over the peninsular portion of Florida during August and September caused high stages on several streams. The St. Johns River experienced record flooding. Pasture and farm lands along the banks of the Kissimmee River were flooded and heavy discharge from the river caused Lake Okeechobee to rise to 0.6 foot above desirable level. Lake Istokpoga overflowed and inundated farm roads. Localized flooding was reported in low-lying sections of Miami and other cities on the coastal ridge.

**ATLANTIC SLOPE DRAINAGE.**--Rivers on the Atlantic Coast remained at low stages throughout the month with only slight rises.

The Susquehanna River reached a record-low stage of 0.28 foot at Wilkes-Barre, Pa., on the 3d and 4th, superseding the previous record-low stage of 0.69 foot recorded on September 18, 1939.

The South Branch of the Potomac reached a record-low stage of 2.6 feet at Springfield, W. Va. It continued at this stage most of the month.

The heavy rains in South Carolina on the 26th and 27th, due to the tropical disturbance "Florence", produced minor flooding on the Edisto River at Orangeburg, S. C.

**EAST GULF OF MEXICO.**--Minor flooding occurred on the Choctawhatchee River at Caryville, Fla., and on the Apalachicola River at Blountstown, Fla., between September 29 and October 5 due to the heavy rains resulting from Hurricane "Florence". Rains over southern Alabama during the 3-day period averaged almost 10 inches, except in the extreme eastern part where the average fell off to less than 6 inches.

The Cahaba River reached a record-low September stage of 1.3 feet at Marion Junction, Ala., on the 19th, exceeding the previous low September stage of 1.32 feet recorded on September 30, 1952.

The Alabama River also reached a record-low stage of 3.6 feet at Millers Ferry, Ala., on September 17 for the lowest September stage of record (1931-1953). The previous lowest September stage was 3.8 feet on September 13, 1951.

**Missouri Basin.**--A record-low stage of -0.20 foot occurred on the Kansas River at Wamego, Kans., on September 30. The previous low stage at this point was 0.5 foot on August 2, 1940. The Republican River reached a record-low stage of 0.86 foot at Condordia, Kans., on September 2. The previous low stage at this point was 2.0 feet on September 26-27, 1945.

**Ohio Basin.**--All streams in the Ohio Basin remained at low levels during the month. There was no flow in the lower portion of the Greenbrier River in southern West Virginia towards

the end of September. The Big Sandy River at Louisa, Ky., is near the record-low stage since dams were built along the river in the 1890's. This is the first time since the dams were built that all portions of the dams, except No. 1 at the mouth of Big Sandy, were completely down during the low-water period.

The Scioto River reached record-low stages at Circleville and Piketon, Ohio, during September. Circleville reported a low stage of 1.45 feet on the 29th. The previous low stage was 1.54 feet measured on October 28, 1952 (record dates back to September 1915). Piketon's record-low stage was -0.71 foot on the 13th. The previous record-low stage at this point was 0.3 foot (record dates back to June 1943).

Streamflow in the Tennessee River Basin in North Carolina was below normal for the sixth consecutive month. Minimum discharges on tributaries of the French Broad River below Mills River and of the Nolichucky near the middle of the month generally equalled or were lower than previous minima of record since 1930.

**Arkansas Basin.**--All streams in the Arkansas Basin remained at low stages during the month. The Arkansas River reached a record-low stage of 0.18 foot at Wichita, Kans., on the 30th. The previous low stage at this point was 0.4 foot on July 27, 1934. At Oxford, Kans., 42 miles below Wichita, the gage was on a sand bar all the month. The same condition existed on the Little Arkansas River at Ripley, Kans., the entire month.

**WEST GULF OF MEXICO DRAINAGE.**--The flooding in the Nueces Basin during September was due to heavy rains between August 31 and September 4. Rainfall amounts up to 8 inches were reported on the Frio River and its tributaries, with 4 to 6 inches on Turkey Creek, a tributary of the Nueces River just north of Cotulla, Tex. Moderate overflows occurred as a result on Turkey Creek and the Frio River. The Nueces River above Cotulla had only small rises, but below Cotulla to Three Rivers was bankfull or slightly over for several days. From Three Rivers to Corpus Christi, Tex., the Nueces River was out of its banks for several days with the area at Calallen, Tex., at flood stage or over for 21 days. The damages from the flooding were estimated at \$46,000.

The overflow on the Navidad River at Ganado, Tex., which began on August 30, continued until September 3.

The Rio Grande reached flood stage at Eagle Pass, Tex., on the 1st of the month. The rise was of the flash type, which flattened out rapidly below Eagle Pass, Tex., and no damage was reported. The rise was due to heavy showers which ranged from 3.5 inches at Eagle Pass, Tex., to 6.9 inches at El Indio, just downstream.

# FLOOD STAGE DATA

Table 5

(All dates in September unless otherwise specified)

SEPTEMBER 1953

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE		<i>Fl.</i>			<i>Fl.</i>
Edisto: Orangeburg, S. C.	8.0	29	Oct. 1	8.5	29
EAST GULF OF MEXICO DRAINAGE					
Apalachicola: Blountstown, Fla.	15	30	Oct. 5	16.2	1
Choctawhatchee: Caryville, Fla.	12	29	Oct. 3	*13.4	30

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
WEST GULF OF MEXICO DRAINAGE	<i>Fl</i>			<i>Fl</i>	
Navidad: Ganado, Tex.	21	Aug. 30	3	28.9	1
Nueces: Cotulla, Tex.	15	5	5	15.2	5
		8	8	15.3	8
Three Rivers, Tex.	37	6	7	37.6	6
Rio Grande: Eagle Pass	16	1	1	16.4	1

\* Provisional  
\* From Hydrograph



# RADIOSONDE DATA

Average monthly values

Table 20

SEPTEMBER 1953

	ALBUQUERQUE, N. MEX. ( 840 MB.)				ATLANTA, GA. ( 981 MB.)				BIG SPRING, TEX. ( 926 MB.)				BISMARCK, N. DAK. ( 954 MB.)				BOISE, IDAHO ( 915 MB.)				BROWNSVILLE, TEX. (1014 MB.)				BUFFALO, N. Y. ( 990 MB.)			
Standard pressure surface (mb)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	29	1,619	24.0	20	30	309	20.9	72	30	784	25.7	34	30	505	14.7	59	30	868	20.2	41	30	7	25.5	79	30	221	15.9	73
1,000----	29	51			30	144			30	100			30	99			30	93			30	126	26.2	74	30	132		
950-----	29	518			30	596	21.7	56	30	561			30	540	15.3	53	30	547			30	582	23.8	63	30	576	16.8	61
900-----	29	1,005			30	1,058	18.8	60	30	1,037	25.9	31	30	999	15.6	43	30	1,014	23.0	26	30	1,049	21.1	56	30	1,031	13.9	63
850-----	29	1,510			30	1,547	15.6	64	30	1,537	22.3	33	30	1,481	12.1	47	30	1,510	20.3	24	30	1,542	18.5	48	30	1,510	10.6	63
800-----	29	2,041	23.0		30	2,059	12.8	59	30	2,060	18.5	36	30	1,986	8.9	46	30	2,029	16.2	27	30	2,059	15.7	38	30	2,013	7.8	55
750-----	29	2,600	18.3		30	2,607	10.3	51	30	2,612	14.6	35	30	2,525	5.8	44	30	2,575	11.7	30	30	2,546	4.8	50	30	2,516	4.8	50
700-----	29	3,183	13.1		30	3,171	7.3	46	30	3,188	10.3	32	30	3,078	2.1	46	30	3,145	7.2	33	29	3,180	9.1	33	30	3,102	1.9	47
650-----	29	3,800	7.5	27	30	3,788	4.1	34	30	3,802	5.7	32	30	3,680	-1.6	47	30	3,757	2.6	38	29	3,797	5.8		30	3,701	-1.4	42
600-----	29	4,452	1.6	35	30	4,424	-5		30	4,449	1.1	33	30	4,306	-5.4	44	30	4,392	-1.9	37	29	4,440	1.9		30	4,330	-5.1	36
550-----	29	5,143	-4.4	44	29	5,118	-4.0		29	5,145	-3.5		30	4,989	-9.6	41	30	5,081	-6.6	37	29	5,140	-2.1		30	5,011	-9.4	
500-----	29	5,888	-10.1	41	28	5,862	-8.9		29	5,892	-8.3		30	5,713	-14.4	40	30	5,815	-12.1	40	29	5,888	-6.5		30	5,739	-13.9	
450-----	29	6,702	-15.0		28	6,685	-14.4		29	6,712	-13.9		30	6,510	-20.0	41	30	6,621	-17.3	35	29	6,713	-11.6		30	6,540	-18.9	
400-----	29	7,574	-21.4		28	7,553	-20.7		29	7,586	-20.4		29	7,364	-26.4	41	30	7,487	-23.8	35	28	7,597	-17.6		30	7,499	-25.0	
350-----	29	8,544	-28.6		28	8,526	-28.1		28	8,559	-27.7		29	8,314	-33.7	37	30	8,446	-31.5		27	8,581	-24.4		30	8,355	-32.1	
300-----	29	9,628	-36.9		27	9,614	-36.1		28	9,649	-35.6		29	9,377	-41.5		30	9,517	-40.1		26	9,682	-32.5		30	9,425	-40.1	
250-----	29	10,864	-45.8		26	10,857	-44.8		27	10,890	-44.4		29	10,591	-49.8		30	10,735	-49.5		25	10,937	-42.5		30	10,647	-48.1	
200-----	29	12,320	-54.7		24	12,324	-53.6		25	12,350	-53.3		29	12,027	-55.9		30	12,170	-56.4		24	12,405	-54.9		30	12,097	-53.8	
175-----	29	13,163	-59.1		24	13,173	-58.2		24	13,198	-58.1		29	12,873	-56.9		30	13,013	-58.3		23	13,242	-62.0		28	12,949	-55.4	
150-----	29	14,119	-63.1		24	14,132	-62.8		24	14,157	-62.5		28	13,839	-56.5		30	13,979	-59.9		23	14,178	-68.8		28	13,926	-57.6	
125-----	28	15,229	-67.1		24	15,243	-66.8		23	15,267	-66.9		28	14,992	-57.5		30	15,111	-61.8		21	15,249	-74.6		27	15,048	-69.7	
100-----	27	16,564	-68.8		23	16,584	-67.2		23	16,604	-68.9		27	16,403	-57.6		29	17,873	-60.1		12	17,863	-69.1		26	16,469	-59.6	
80-----	26	17,906	-65.4		21	17,936	-64.5		22	17,947	-65.9		27	17,813	-56.6		26	19,676	-56.9		10	19,612	-62.1		23	19,682	-55.3	
60-----	26	19,679	-60.0		21	19,717	-59.3		21	19,715	-59.8		25	19,642	-54.9		25	20,838	-55.4		8	20,743	-57.8		22	20,851	-53.7	
50-----	22	20,828	-56.9		19	20,864	-57.1		15	20,845	-57.9		22	20,807	-54.0		21	22,273	-53.3		6	22,163	-55.0		21	22,294	-52.4	
40-----	18	22,245	-54.7		17	22,286	-54.8		10	22,254	-54.7		16	22,237	-53.0		21	24,127	-51.4						18	24,148	-51.3	
30-----	9	24,073	-52.9		12	24,110	-51.6		5	24,119	-51.9														8	26,782	-50.3	
20-----																												

	BURRWOOD, LA. (1014 MB.)				CARIBOU, ME. ( 992 MB.)				CHARLESTON, S. C. (1015 MB.)				COLUMBIA, MO. ( 987 MB.)				DODGE CITY, KANS. ( 925 MB.)				EL PASO, TEX. ( 882 MB.)				ELY, NEV. ( 811 MB.)			
Standard pressure surface (mb)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	3	25.5	80	30	191	11.8	82	30	13	22.0	89	30	238	21.0	48	30	792	22.0	40	30	1,195	25.2	26	29	1,908	17.3	24
1,000----	30	124	25.5	72	30	119			30	140	23.5	79	30	122			30	102			30	73			29	70		
950-----	30	582	23.2	64	30	557	12.1	71	30	596	21.7	72	30	573	22.8	37	30	556			30	545			29	533		
900-----	30	1,044	20.2	59	30	1,002	9.8	69	30	1,056	18.7	71	30	1,039	19.6	39	30	1,030	24.5	34	30	1,024	25.8	20	29	1,011		
850-----	30	1,535	17.3	52	30	1,475	7.0	68	30	1,545	15.9	67	30	1,528	16.4	40	30	1,527	21.1	36	30	1,523	25.8	20	29	1,505		
800-----	30	2,050	14.6	43	30	1,971	4.5	62	30	2,058	13.4	57	30	2,041	13.6	38	30	2,048	17.5	37	30	2,051	21.5	21	29	2,029	20.8	18
750-----	30	2,600	12.3	32	30	2,501	2.4	57	30	2,609	10.7	51	30	2,589	10.1	42	30	2,595	13.4	38	30	2,612	16.8	23	29	2,585	16.8	21
700-----	30	3,169	9.2	30	30	3,050	-1	54	30	3,172	7.8	47	30	3,151	6.3	41	30	3,172	9.5	39	30	3,186	11.6	27	29	3,165	11.7	25
650-----	29	3,783	5.8	27	30	3,645	3.0	52	30	3,788	4.5	40	30	3,760	2.8	37	30	3,796	5.2	40	30	3,804	6.1	31	29	3,779	6.0	32
600-----	29	4,429	1.9	30	30	4,271	-6.3	48	30	4,427	-4.5	37	30	4,398	-1.5	39	30	4,431	-6	42	30	4,448	1.0	32	29	4,428	1.40	
550-----	29	5,129	-2.5		30	4,949	-10.0	44	30	5,127	-3.4		30	5,086	-6.1	38	29	5,123	-5.0	41	30	5,146	-3.5		29	5,117	-5.6	45
500-----	29	5,874	-7.5		30	5,675	-14.7	39	30	5,866	-8.1		30	5,825	-11.0		29	5,867	-10.6		30	5,887	-8.2		29	5,858	-11.0	42
450-----	29	6,699	-13.1		30	6,472	-20.3	38	30	6,692	-13.7		30	6,635	-16.8		29	6,678	-16.1		30	6,708	-13.7		29	6,686	-16.3	
400-----	29	7,575	-18.7		30	7,327	-26.4	35	30	7,564	-19.8		30	7,500	-23.4		29	7,545	-22.8		30	7,582	-20.0		29	7,536	-22.6	
350-----	28	8,553	-25.5		30	8,277	-33.2		30	8,540	-26.8		29	8,459	-31.1		29	8,508	-30.5		30	8,556	-27.3		29	8,501	-30.4	
300-----	28	9,653	-33.5		30	9,343	-40.4		30	9,634	-35.1		29	9,532	-39.7		29	9,583	-39.3		30							

# RADIOSONDE DATA

Average monthly values

Table 20—Continued

SEPTEMBER 1953

Standard pressure surface (mb.)	INTERNAT. FALLS, MINN. (969 MB.)				LAKE CHARLES, LA. (1014 MB.)				LANDER, WYO. (831 MB.)				LAS VEGAS, NEV. (935 MB.)				LITTLE ROCK, ARK. (1006 MB.)				MAZATLAN, MEXICO (1008 MB.)				MEDFORD, ORE. (968 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	360	11.1	82	30	5	24.4	77	30	1,696	17.2	34	30	660	29.6	13	30	79	22.7	61	30	14	29.4	77	30	401	22.0	57
1,000--	28	562	12.5	73	30	571	26.1	63	30	73			30	48			30	129	24.7	52	30	82	28.0	77	30	112		
950--	28	526	12.5	73	30	587	24.6	56	30	530			30	514			30	583	25.1	39	30	545	26.8	72	30	569	23.7	42
900--	28	498	10.5	66	30	1,054	20.6	58	30	1,003			30	997	30.5		30	1,016	21.6	41	30	1,514	21.5	51	30	1,032	21.4	41
850--	28	1,451	7.8	60	30	1,546	17.5	56	30	1,497			30	1,503	26.3		30	1,545	18.3	40	30	2,036	18.1	48	30	1,561	17.9	46
800--	28	1,949	4.7	60	30	2,061	14.8	48	30	2,018	18.1	27	30	2,032	21.5		30	2,062	15.3	38	30	2,036	18.1	48	30	2,039	14.4	43
750--	28	2,478	1.8	60	30	2,611	12.5	30	30	2,571	13.7	30	30	2,586	16.4		30	2,612	12.0	37	30	2,591	14.5	53	30	2,585	10.8	39
700--	28	3,025	-1.2	54	30	3,180	9.3	25	30	3,142	9.1	34	30	3,166	11.0	26	30	3,179	8.6	33	30	3,165	10.5	57	30	3,153	7.2	37
650--	28	3,614	-4.5	50	30	3,796	5.0	29	30	3,754	4.2	38	30	3,779	5.7	32	30	3,791	4.6	33	30	3,782	6.1	58	30	3,764	3.2	31
600--	28	4,280	-8.6	50	30	4,438	-9.6		30	4,396	-1.1	44	30	4,427	-5.3	34	30	4,435	-5.1	31	30	4,430	2.1	57	30	4,402	-1.2	31
550--	28	4,908	-13.1	47	30	5,135	-13.6		30	5,023	-10.7	41	30	5,121	-10.4		30	5,128	-10.4		30	5,129	-10.3		30	5,090	-5.7	
500--	28	5,626	-17.4	40	30	5,877	-18.5		30	5,823	-16.0	34	30	5,863	-16.8		30	5,872	-16.8		30	5,884	-16.8		30	5,829	-10.9	
450--	28	6,415	-22.5		30	6,698	-23.9		30	6,629	-22.3		30	6,674	-22.1		30	6,692	-22.1		30	6,709	-22.1		30	6,639	-16.7	34
400--	28	7,262	-28.5	40	30	7,571	-29.3		30	7,502	-27.3		30	7,546	-27.1		30	7,562	-27.1		30	7,604	-27.1		30	7,506	-22.8	
350--	27	8,021	-35.5		30	8,346	-36.0		30	8,267	-34.9		30	8,311	-34.9		30	8,334	-34.9		30	8,379	-34.9		30	8,301	-30.2	
300--	27	9,257	-42.6		30	9,639	-43.9		30	9,544	-42.5		30	9,590	-42.5		30	9,620	-42.5		30	9,661	-42.5		30	9,588	-38.9	
250--	27	10,466	-49.7		30	10,887	-51.0		30	10,769	-49.7		30	10,823	-49.7		30	10,858	-49.7		30	10,900	-49.7		30	10,828	-45.5	
200--	27	11,912	-52.7		30	12,353	-53.8		30	12,213	-52.3		30	12,279	-52.3		30	12,315	-52.3		30	12,446	-52.3		30	12,372	-48.5	
175--	27	12,772	-53.4		30	13,200	-54.1		30	13,059	-52.3		30	13,126	-52.3		30	13,164	-52.3		30	13,297	-52.3		30	13,221	-48.5	
150--	27	13,760	-54.5		30	14,153	-54.8		30	14,029	-52.3		30	14,086	-52.3		30	14,122	-52.3		30	14,236	-52.3		30	14,153	-48.5	
125--	27	14,923	-55.5		30	15,351	-55.7		30	15,217	-53.7		30	15,282	-53.7		30	15,318	-53.7		30	15,446	-53.7		30	15,372	-48.5	
100--	25	16,339	-55.4		30	16,757	-55.7		30	16,611	-53.7		30	16,676	-53.7		30	16,712	-53.7		30	16,836	-53.7		30	16,761	-48.5	
80--	22	17,769	-54.9		30	18,187	-55.2		30	18,041	-53.2		30	18,106	-53.2		30	18,142	-53.2		30	18,266	-53.2		30	18,191	-48.5	
60--	20	19,625	-54.0		30	20,043	-54.3		30	19,897	-52.3		30	19,962	-52.3		30	20,000	-52.3		30	20,124	-52.3		30	20,049	-48.5	
50--	13	20,830	-53.0		30	21,248	-53.3		30	21,102	-51.3		30	21,167	-51.3		30	21,203	-51.3		30	21,327	-51.3		30	21,252	-48.5	
40--	5	22,318	-51.2		30	22,736	-51.5		30	22,590	-49.5		30	22,655	-49.5		30	22,691	-49.5		30	22,815	-49.5		30	22,740	-48.5	
30--					30	24,033	-53.6		30	23,887	-51.6		30	23,952	-51.6		30	24,000	-51.6		30	24,124	-51.6		30	24,049	-48.5	
20--					30				30				30				30				30				30			

These average values for standard pressure surfaces were obtained by radio-sondes; dynamic height (geopotential) in units of .98 dynamic meter, tempera- ture in degrees centigrade and relative humidity in percent.



# RADIOSONDE DATA

Average monthly values

Table 20—Continued

SEPTEMBER 1953

Standard pressure surface (mb)	SAN JUAN, P. R. (1012 MB.)				SANTA MARIA, CALIF. (1006 MB.)				S. STE. MARIE, MICH. ( 988 MB.)				SPOKANE, WASH. ( 932 MB.)				SWAN ISLAND, W. I. (1010 MB.)				TACUBAYA, MEXICO ( 775 MB.)				TAMPA, FLA. (1013 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	19	26.4	83	30	71	15.7	85	29	221	11.6	86	30	722	18.2	38	30	10	27.3	85	30	2,306	15.6	70	30	7	24.7	86
1,000---	30	127	25.9	80	30	118	15.5	85	29	116			30	112			30	100	27.2	80	30	75			30	123	24.8	84
950----	30	585	23.2	79	30	563	17.2	66	29	552	12.2	72	30	557			30	555	24.3	80	30	536			30	579	22.5	79
900-----	30	1,049	20.3	78	30	1,019	21.0	35	29	1,000	10.0	71	30	1,022	18.1	33	30	1,027	21.4	78	30	1,015			30	1,043	19.9	76
850-----	30	1,542	17.8	71	30	1,512	19.3	31	29	1,473	7.5	71	30	1,507	14.3	37	30	1,521	18.6	74	30	1,505			30	1,534	17.0	73
800-----	30	2,059	15.5	61	30	2,030	16.6	30	29	1,971	5.2	65	30	2,015	10.4	40	30	2,040	15.8	69	30	2,033			30	2,050	14.4	69
750-----	30	2,604	12.6	53	30	2,579	13.2	26	29	2,503	2.3	65	30	2,554	6.6	41	30	2,592	12.9	62	30	2,584	13.6	70	30	2,601	11.4	66
700-----	30	3,161	9.2	49	30	3,152	9.3	22	29	3,051	- 1.5	60	30	3,112	3.2	37	30	3,162	9.8	58	30	3,157	9.6	73	30	3,167	8.3	50
650-----	30	3,798	5.6	44	30	3,764	5.3		29	3,646	- 3.7	58	30	3,715	- 4	36	30	3,782	6.4	54	30	3,777	5.5	77	30	3,793	5.2	54
600-----	30	4,442	1.7	43	30	4,409	.7		28	4,265	- 7.5	55	29	4,344	- 4.2	36	30	4,427	2.6	55	30	4,421	1.8	78	30	4,426	1.6	56
550-----	30	5,137	- 2.5	40	30	5,101	- 4.1		28	4,940	-11.5	51	29	5,026	- 8.4	34	30	5,126	- 1.5	59	30	5,124	- 2.0	76	30	5,127	- 2.3	50
500-----	30	5,889	- 6.9	37	30	5,846	- 9.3		28	5,661	-16.0	45	29	5,757	-13.4	36	30	5,880	- 5.9	55	30	5,872	- 5.7	66	30	5,874	- 6.7	54
450-----	30	6,711	-12.0	36	30	6,661	-15.3		27	6,463	-20.7	37	29	6,557	-18.8	40	30	6,710	-10.6	49	30	6,700	-10.2	61	30	6,703	-11.5	53
400-----	30	7,596	-17.6	37	30	7,531	-22.0		27	7,315	-26.6		29	7,418	-24.7	35	30	7,595	-16.2	42	29	7,591	-16.0	52	30	7,584	-16.9	50
350-----	30	8,581	-24.7		30	8,498	-29.7		27	8,265	-33.7		29	8,373	-32.2	34	30	8,586	-22.9	35	28	8,583	-22.8		30	8,571	-23.8	45
300-----	30	9,683	-33.2		30	9,578	-37.9		27	9,328	-41.7		29	9,440	-40.8		30	9,695	-31.4		28	9,695	-30.9		30	9,678	-31.8	42
250-----	30	10,938	-42.8		30	10,809	-46.3		26	10,543	-49.5		28	10,646	-50.5		30	10,957	-41.5		25	10,961	-41.0		30	10,940	-41.9	
200-----	30	12,405	-54.2		30	12,263	-54.5		26	11,988	-54.0		27	12,067	-57.5		30	12,430	-53.6		23	12,441	-53.4		30	12,412	-53.9	
175-----	29	13,251	-60.4		30	13,109	-58.5		25	12,843	-54.2		27	12,907	-58.1		30	13,274	-60.5		20	13,287	-60.6		30	13,256	-60.7	
150-----	29	14,195	-66.8		29	14,068	-62.4		25	13,828	-55.7		27	13,875	-58.9		29	14,215	-67.9		13	14,233	-67.7		29	14,197	-67.0	
125-----	28	15,279	-72.4		29	15,181	-65.9		22	15,004	-57.5		27	15,015	-59.7		25	15,291	-75.0						27	15,287	-70.9	
100-----	25	16,583	-73.7		27	16,531	-66.7		11	16,368	-55.8		26	16,413	-59.1		23	16,570	-77.7						25	16,596	-72.7	
80-----	21	17,898	-71.4		26	17,885	-64.0						24	17,815	-57.3		20	17,866	-71.6						18	17,923	-68.8	
60-----	19	19,623	-65.3		22	19,666	-59.3						20	19,639	-55.4		18	19,587	-65.0						17	19,667	-63.5	
50-----	16	20,746	-61.5		19	20,822	-56.2						20	20,812	-53.9		17	20,709	-61.3						15	20,795	-60.2	
40-----	12	22,135	-58.3		16	22,245	-53.6						13	22,232	-52.5		14	22,096	-58.1						13	22,183	-57.3	
30-----	6	23,959	-54.4		11	24,107	-51.0						8	24,117	-50.7		12	23,927	-53.2						5	23,991	-54.7	

Standard pressure surface (mb)	TATOOSH ISLAND, WASH. (1013 MB.)				VERACRUZ, MEXICO (1009 MB.)				WASHINGTON, D. C. (1009 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	31	13.5	90	30	13	28.3	74	30	88	18.4	75
1,000---	30	138	14.5	82	30	96	27.6	75	30	150	19.8	68
950----	30	572	13.6	67	30	546	24.0	75	30	598	18.9	62
900-----	30	1,026	12.1	63	30	1,021	21.0	72	30	1,055	16.1	64
850-----	30	1,503	10.0	50	30	1,515	18.3	72	30	1,539	13.3	59
800-----	30	2,005	8.0	43	30	2,033	15.3	69	30	2,047	10.8	55
750-----	30	2,542	5.8		30	2,586	12.3	62	30	2,590	8.2	53
700-----	30	3,097	3.0		30	3,155	9.3	60	30	3,149	4.9	55
650-----	30	3,698	- 1.3	40	30	3,772	6.1	55	30	3,757	1.6	53
600-----	29	4,337	- 4.2	36	30	4,418	2.3	59	29	4,389	- 2.0	49
550-----	29	5,018	- 8.6	36	30	5,116	- 1.6	61	29	5,078	- 5.9	44
500-----	28	5,759	-13.2	41	29	5,871	- 5.6	58	29	5,816	-10.3	36
450-----	28	6,561	-18.4	40	27	6,700	-10.2	50	29	6,628	-15.4	
400-----	28	7,422	-24.6		25	7,589	-15.5	45	29	7,499	-21.9	
350-----	28	8,378	-32.3		23	8,582	-22.2		29	8,466	-29.2	
300-----	28	9,446	-41.0		19	9,697	-30.4		29	9,547	-37.5	
250-----	27	10,654	-50.8		17	10,966	-40.6		29	10,780	-46.1	
200-----	27	12,077	-58.3		14	12,450	-53.1		29	12,233	-54.4	
175-----	27	12,913	-59.3		12	13,290	-60.2		28	13,074	-58.0	
150-----	26	13,871	-59.0		10	14,232	-67.7		28	14,037	-61.0	
125-----	25	15,015	-59.8		7	15,317	-74.6		28	15,160	-63.8	
100-----	24	16,410	-58.9		6	16,588	-77.5		27	16,526	-64.0	
80-----	22	17,804	-56.8						25	17,897	-61.7	
60-----	19	19,626	-55.5						18	19,702	-57.6	
50-----	13	20,785	-54.7						16	20,852	-56.2	
40-----	8	22,186	-53.5						15	22,278	-54.1	
30-----									15	24,131	-52.1	
20-----									8	26,749	-49.1	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T.. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and

expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

# PILOT BALLOON DATA

Average monthly resultant winds

Table 21

SEPTEMBER 1953

Altitude (meters) m.a.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			P. ownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed	
Surface	30	164	2.8	30	246	1.9	29	281	1.6	30	282	4.1	30	323	4.3	30	69	5.0	30	258	4.0	30	193	1.0	29	97	1.9	29	258	1.7	30	166	2.0	30	210	3.1
500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,000	30	179	3.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,500	30	185	3.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2,000	30	196	3.2	30	253	2.9	29	280	4.6	27	282	7.2	30	290	3.1	25	55	3.5	24	259	6.6	20	263	8.9	24	95	8.8	28	267	3.6	30	139	2.2	29	216	3.1
2,500	30	194	2.3	30	245	2.7	29	279	6.6	25	283	9.7	30	272	4.0	22	58	4.1	18	274	10.3	18	274	11.5	24	218	2.2	26	295	5.7	30	124	2.4	30	215	3.2
3,000	29	188	1.2	30	254	2.8	28	278	8.9	24	285	11.4	29	271	5.4	22	64	4.9	18	275	12.1	16	278	12.2	21	282	2.3	25	294	6.8	30	116	1.6	30	235	3.9
4,000	29	180	0.9	30	241	2.9	25	276	12.2	23	292	14.5	29	271	8.2	14	61	5.3	11	263	12.7	15	283	15.1	17	304	3.9	20	291	9.0	29	64	8.8	29	235	3.1
5,000	27	325	1.3	29	269	3.0	23	281	15.3	22	289	17.9	28	269	10.0	11	60	3.4	---	---	---	13	267	16.8	16	298	4.7	19	291	12.1	29	49	4.4	26	238	5.3
6,000	24	305	6.1	27	277	7.1	10	283	15.4	12	284	18.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8,000	29	257	6.5	14	287	17.5	21	281	8.1	13	274	15.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10,000	24	296	11.7	26	279	11.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12,000	20	286	19.1	11	259	18.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
16,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m.a.l.	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)			Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			*Oklahoma City, Okla. (396 m.)		
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed	
Surface	30	276	3.5	30	247	3.6	27	193	0.5	28	266	3.2	28	92	3.1	30	99	1.6	30	253	1.0	30	134	4.1	29	31	2.7	30	321	2.3	30	280	3.9	30	175	2.5
500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,500	30	278	3.4	29	254	7.8	25	305	0.9	28	264	6.2	17	49	9	30	322	1.0	29	189	1.0	28	159	3.0	22	29	4.4	27	326	1.4	25	149	1.6	30	210	2.9
2,000	30	287	3.6	25	263	9.7	23	311	2.0	27	263	7.0	14	349	1.8	30	329	2.4	29	200	2.2	28	177	3.3	19	26	4.9	27	326	2.0	25	162	2.7	30	230	3.4
2,500	30	280	4.1	23	266	9.9	23	311	3.0	24	261	9.1	13	334	1.7	30	334	4.0	28	215	3.2	25	196	4.0	17	24	5.6	26	324	3.3	25	164	3.3	30	249	4.1
3,000	30	271	4.6	23	271	11.0	23	293	4.3	22	270	9.7	11	326	1.5	29	331	5.0	28	219	4.1	24	202	4.5	17	21	5.3	26	322	5.4	25	158	3.7	30	272	4.8
4,000	29	258	4.6	18	278	13.6	23	281	5.6	17	276	11.9	11	293	2.5	23	329	6.2	27	235	4.9	20	305	4.6	12	15	5.3	24	309	7.1	25	172	5.1	30	287	5.5
5,000	29	257	6.5	14	287	17.5	21	281	8.1	13	274	15.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6,000	28	271	9.0	13	284	16.8	20	282	9.8	10	269	13.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8,000	26	272	10.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10,000	22	272	15.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12,000	18	273	20.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
16,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m.a.l.	Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			*Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (725 m.)			** Washington, D.C. (88 m.)				
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations				
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed			
Surface	30	380	1.1	30	202	1.1	30	4	2.3	30	265	2.0	30	253	1.3	29	139	1.6	28	294	4.4	30	262	2.7	29	270	0.8	30	234	2.8	30	174	1.0		
500	30	264	1.2	30	200	1.2	---	---	---	30	259	2.4	30	248	2.5	29	129	1.4	27	302	3.9	30	275	4.1	29	226	1.3	---	---	---	---	---	---		
1,000	30	263	2.5	30	186	1.3	---	---	---	30	266	4.0	30	251	3.4	29	124	1.8	24	261	1.8	30	277	5.7	26	216	2.5	30	235	3.2	29	239	2.8		
1,500	30	262	5.2	30	181	1.6	30	324	3.0	28	268	6.5	30	252	4.5	29	97	1.4	24	198	2.1	30	278	7.7	23	211	2.5	30	237	3.8	29	250	4.7		
2,000	30	273	7.7	30	181	1.6	30	289	4.6	27	268	9.2	30	267	5.4	29	70	2.3	24	175	3.8	30	285	9.3	19	204	3.3	30	237	5.2	29	264	5.7		
2,500	30	275	9.8	30	187	1.9	30	277	6.5	27	271	10.1	29	278	7.8	25	70	3.1	24	166	4.5	30	281	10.8	17	212	3.6	28	250	6.6	29	274	6.4		
3,000	27	280	11.3	30	177	2.4	29	274	9.1	22	272	11.4	28	286	9.1	25	76	4.0	24	164	4.8	30	280	11.9	17	237	4.7	27	253	7.8	29	267	7.9		
4,000	25	289	12.6	30	178	2.7	26	287	12.5	18	276	14.7	26	295	12.2	24	71	3.2	24	171	5.8	29	281	14.7	15	258	6.7	24	261	11.4	29	266	8.9		
5,000	22	294	14.4	29	191	1.8	23	292	15.1	13	296	15.5	25	300	12.8	19	72	1.6	24	182	6.5	29	280	16.3	14	269	8.6	19	266	12.8	28	265	10.6		
6,000	19	290	16.1	28	235	2.5	20	283	16.6	12	291	17.5	23	297	12.5	19	344	1.9	23	191	5.1	29	281	16.5	13	270	9.5	19	266	14.5	28	260	12.1		
8,000	---	---	---	26	256	8.3	16	288	19.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10,000	---	---	---	19	250	14.1	10	289	18.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12,000	---	---	---	15	257	19.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
14,000	---	---	---																																



## Average monthly resultant winds

Table 22

SEPTEMBER 1953

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			Int. Falls, Minn. (358 m.)			
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed				
Surface-----	30	122	2.5	30	146	4.0	30	335	1.5	30	82	2.3	30	65	2.8	30	238	2.6	29	80	1.3	30	106	0.7	30	62	1.3	30	143	0.6	30	80	1.1	30	206	1.5	
500-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
1,000-----	---	---	---	30	155	6.1	30	315	3.9	30	84	5.2	30	55	5.7	30	265	5.4	29	120	3.4	30	173	1.3	---	---	---	---	30	138	1.6	29	131	2.7	30	224	3.0
1,500-----	---	---	---	30	172	6.7	30	304	5.8	30	70	4.6	29	52	6.2	30	272	8.1	29	130	2.1	30	249	5.7	29	68	1.1	30	227	.9	29	189	1.8	28	280	7.2	
2,000-----	30	192	2.4	30	191	4.4	30	296	8.2	30	55	4.0	29	34	6.5	30	271	8.5	28	136	1.0	30	260	7.1	28	233	1.9	30	284	1.1	29	241	1.5	28	287	8.1	
2,500-----	30	216	2.9	30	204	2.3	30	300	10	30	56	3.7	29	43	6.7	30	266	9.5	28	190	---	30	269	8.5	29	255	2.7	29	286	1.8	28	259	1.2	28	283	10.4	
3,000-----	30	232	2.5	30	253	1.0	30	299	11.6	30	56	4.4	29	40	6.2	30	265	11.1	28	215	1.3	30	275	9.3	29	250	3.1	29	277	2.4	28	252	2.4	28	286	11.6	
4,000-----	30	270	4.2	30	348	2.1	30	298	13.3	29	56	3.2	29	30	5.1	28	264	13.0	26	231	2.9	29	287	10.7	29	251	4.1	30	247	4.2	28	243	4.0	26	293	13.5	
5,000-----	30	282	5.1	29	17	2.8	27	292	15.6	29	35	2.3	29	11	3.3	24	265	12.9	26	239	2.6	29	291	12.9	30	261	5.8	30	265	5.6	28	243	6.0	24	299	15.5	
6,000-----	30	299	6.6	29	360	2.7	27	287	15.9	29	327	1.6	29	342	3.6	24	266	14.0	27	252	3.8	29	294	13.1	30	275	8.1	29	270	8.3	27	248	8.9	20	302	17.7	
8,000-----	30	296	7.3	28	322	4.4	21	277	17.3	27	271	5.6	27	262	8.3	17	260	17.7	28	253	9.3	27	289	13.5	28	278	12.0	29	263	10.9	26	251	10.5	13	296	19.1	
10,000-----	30	288	10.5	26	299	11.2	17	278	15.6	25	254	9.2	27	264	13.7	14	269	19.8	29	254	17.6	20	283	13.7	24	276	11.3	29	255	17.0	26	250	19.4				
12,000-----	28	276	17.9	28	289	15.7	15	285	17.3	23	263	11.0	28	261	15.4	10	269	22.4	26	244	20.8	19	284	18.4	21	281	14.5	20	247	22.3	23	252	21.2				
14,000-----	22	286	15.3	21	285	15.7	10	286	13.4	22	275	8.6	26	267	12.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
16,000-----	20	292	11.3	19	296	9.1	---	---	---	14	335	.9	25	266	5.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
18,000-----	18	302	6.5	18	348	.6	---	---	---	10	86	6.3	17	101	3.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
20,000-----	12	48	4.1	14	86	4.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
22,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
24,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					

These free-air resultant winds are based on rawin observations made near 0300 G.C.T., directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°).

speeds in meters per second.

Note. Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three.

See note following table 22 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

# SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun.

SEPTEMBER 1953

Date	Sun's zenith distance								
	A. M.				0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
ALBUQUERQUE, N. MEX.									
	Air mass								
	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08
Sept.									
1	---	---	---	---	---	1.25	1.06	0.91	0.81
2	0.88	1.00	1.13	1.29	1.49	---	---	---	---
3	.69	.83	.99	1.18	1.43	1.27	1.09	.99	.91
4	.70	.84	.98	(1.20)	(1.50)	1.29	1.16	1.04	.95
5	.83	.95	1.17	1.34	1.48	1.32	1.16	1.05	.95
6	---	---	---	1.21	1.42	---	---	---	---
7	.74	.86	.99	---	---	1.17	.99	---	.76
8	.86	.98	1.10	1.28	1.42	1.28	1.14	1.03	.93
9	.92	1.01	1.15	1.29	---	1.26	1.00	---	---
10	.79	.91	1.02	1.18	1.42	1.22	---	---	---
11	.88	.99	1.11	1.26	1.47	1.17	.99	.86	.75
12	.76	.88	1.01	1.20	1.48	1.29	1.11	.96	.84
13	---	---	---	1.05	1.23	---	---	.96	.84
14	.90	1.00	1.12	1.29	1.41	1.09	.91	.82	.70
15	.90	1.01	1.12	1.29	1.39	---	---	1.01	.89
16	.66	.77	.92	1.09	1.40	1.15	.98	.81	.71
17	.99	1.08	1.22	1.34	1.51	1.39	1.46	1.15	1.02
18	1.05	1.15	1.26	1.41	1.57	1.40	1.27	1.14	.98
19	.45	.69	.84	1.04	1.34	1.24	.82	.63	.51
20	.46	.59	.71	.93	1.07	---	.80	---	---
21	.61	.75	.92	1.15	---	1.25	---	.96	.86
22	1.00	1.11	1.22	1.39	1.49	1.35	1.22	1.09	.99
23	1.00	1.10	1.22	1.38	1.53	1.39	1.21	---	.94
24	.97	1.09	1.22	1.39	1.54	1.41	1.25	1.14	1.01
25	.92	1.03	1.14	1.32	1.51	1.19	.95	.78	.67
26	.82	.93	1.05	1.23	1.64	1.25	1.13	1.00	.87
27	.92	1.03	1.15	1.31	---	1.30	1.12	.98	.87
28	.73	.86	.99	1.16	---	1.14	---	.82	---
Aver-	.82	.94	1.07	1.24	1.45	1.26	1.08	.95	.85
ages									
Departures	-.03	-.03	-.02	-.01	-.03	-.01	-.03	-.04	-.05

TABLE MOUNTAIN, CALIF.

	Air mass								
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
Sept. 1	---	---	---	---	---	---	---	---	---
2	1.05	1.13	1.24	1.37	---	---	---	---	---
3	---	---	---	1.34	---	---	---	---	---
4	---	---	---	1.36	---	---	---	---	---
5	---	---	---	1.46	---	---	---	---	---
6	1.13	1.21	1.32	1.44	---	---	---	---	---
7	1.06	1.15	1.26	1.39	---	---	---	---	---
Aver-	1.08	1.16	1.27	1.39	---	---	---	---	---
ages	---	---	---	---	---	---	---	---	---
Departures	-.04	-.05	-.05	-.05	---	---	---	---	---

\* No observations - due forest fire in vicinity

MADISON, WIS.

	Air mass								
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
NO DATA DURING SEPTEMBER 1953									

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
BLUE HILL, MASS.									
	Air mass								
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
Sept. 1-----	---	---	---	1.18	---	1.12	0.94	0.79	0.70
2-----	---	---	---	1.03	---	---	---	---	---
3-----	---	---	0.66	.92	---	1.01	.79	.64	.55
4-----	0.61	0.76	.90	1.14	---	1.21	1.02	---	.78
5-----	.86	.95	1.07	1.25	---	---	---	---	---
6-----	.94	1.03	1.16	1.30	---	1.30	1.12	1.01	.90
7-----	.76	.84	1.06	1.17	---	---	---	---	---
8-----	.58	.73	.92	1.14	---	---	---	---	---
9-----	---	---	---	---	---	1.21	1.05	.82	.63
10-----	.73	.98	1.10	---	---	---	---	---	---
11-----	.73	.86	.98	1.14	---	1.12	.96	.82	.70
12-----	.73	.82	1.00	---	---	---	---	---	---
13-----	.86	.97	1.10	1.24	---	1.32	1.18	1.01	.90
14-----	.87	1.03	1.14	1.26	---	1.16	1.02	.95	.85
15-----	.72	.83	.95	1.17	---	---	---	---	---
16-----	---	---	---	---	---	1.07	.96	.81	.69
17-----	.69	.79	.95	1.14	---	1.15	.99	.83	.70
18-----	.50	.60	.74	.95	---	---	---	---	---
Averages	.74	.86	.98	1.15	---	1.17	1.00	.85	.74
Departures	-.03	-.01	-.02	+.02	---	+.04	+.06	+.04	-.06

LINCOLN, NEBR.

	Air mass								
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
Sept. 1	---	0.86	0.97	1.12	1.25	1.03	0.86	0.73	0.62
2	---	.77	.92	1.11	1.27	1.06	.84	.69	.58
3	0.62	.73	.86	1.06	1.25	1.03	.82	.67	.56
4	.72	.81	.94	1.12	1.36	1.17	.94	.79	.69
5	.84	.77	.92	1.08	1.28	1.12	.97	.86	.71
6	.62	.73	.86	1.06	1.37	1.12	1.06	.92	.82
7	---	---	.77	.98	1.24	1.01	.79	.60	.50
8	.64	.77	.90	1.09	1.29	1.10	.88	.77	.67
9	.83	.94	1.05	1.20	1.39	1.20	1.03	.88	.73
10	.70	.83	.94	1.09	1.34	1.03	.79	.62	.50
11	.72	.83	.94	1.09	1.24	1.08	.86	.71	.58
12	.54	.66	.75	.98	1.20	1.03	.86	.73	.62
13	.58	.69	.84	1.01	1.23	---	---	---	---
14	.66	.77	.90	1.07	1.32	1.14	.99	.84	.75
Aver-	.66	.78	.90	1.08	1.29	1.09	.90	.75	.64
ages	---	---	---	---	---	---	---	---	---
Departures	-.07	-.06	.06	-.05	-.09	-.05	+.06	+.07	+.07

BOSTON, MASS.

	Air mass								
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
NO DATA DURING SEPTEMBER 1953									

\* Extrapolated

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of

pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.



# SOLAR RADIATION DATA

SEPTEMBER 1953

**Table 31a** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

	Avg																Avg																Avg			
Date	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23													
Langleys	89	103	106	113	74	95	118	100	117	118	131	130	122	103	133	122	137	124	120	---	66	133	123	119												
Date	24	25	26	27	28	29	30																													
Langleys	90	142	139	138	128	116	123	125																												

**Table 31b** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

	Avg									Avg									Avg					
Date-----	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23	
Langleys-----	296	115	201	144	75	326	353	216	356	327	321	96	316	112	80	230	317	298	310	201	41	84	317	224
Date-----	24	25	26	27	28	29	30																	
Langleys-----	309	276	184	162	228	276	249	241																

**Table 31c** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

	Avg									Avg									Avg				
Date	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23
Langleys	373	277	342	137	141	415	394	297	430	377	293	236	433	111	187	295	311	420	410	240	48	204	494
Date	24	25	26	27	28	29	30																
Langleys	489	337	372	220	415	478	340	379															

**Table 31d** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

	Avg									Avg									Avg					
Date-----	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23	
Langleys----	296	282	299	105	133	336	342	256	345	265	120	290	291	65	219	228	221	309	298	130	75	199	325	223
Date-----	24	25	26	27	28	29	30																	
Langleys-----	302	147	196	113	284	284	95	203																

**Table 31e** Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

	Avg									Avg									Avg					
Date-----	3	4	5	6	7	8	9		10	11	12	13	14	15	16		17	18	19	20	21	22	23	
Langleys-----	90	166	154	182	118	66	61	122	46	108	143	141	111	149	131	119	119	101	103	179	72	128	50	108
Date-----	24	25	26	27	28	29	30																	
Langleys-----	69	131	121	158	94	59	99	104																

Note: Langley is the unit used to denote one gram calorie per square centimeter.

# SOLAR RADIATION DATA

**Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langley's.**

1953	Akilavik, MacKenzie	Albuquerque, N. Mex.	Apalachicola, Fla.	Astoria, Ore.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Big Spring, Texas	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Texas	Canton Island	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Columbus, Ohio	Davis, Calif.	Dodge City, Kans.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Texas	Ely, Nevada	Fairbanks, Alaska	Ft. Worth, Texas	Fresno, Calif.	Glasgow, Mont.	Grand Junction, Colo.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Averages		
																																					Sept. 3	Sept. 4	
Sept. 3	284	677	---	581	316	121	206	---	332	510	577	374	517	695	485	394	422	427	568	399	288	509	---	678	673	401	258	619	453	---	504	519	648	245	704	475	284	677	
Sept. 4	352	665	---	566	349	116	122	---	393	367	572	374	517	695	485	394	422	427	568	399	288	509	---	678	673	401	258	619	453	---	504	519	648	245	704	475	352	665	
Sept. 5	400	670	---	566	349	131	122	---	380	367	572	374	517	695	485	394	422	427	568	399	288	509	---	678	673	401	258	619	453	---	504	519	648	245	704	475	400	670	
Sept. 6	194	668	---	566	349	131	122	---	380	367	572	374	517	695	485	394	422	427	568	399	288	509	---	678	673	401	258	619	453	---	504	519	648	245	704	475	194	668	
Sept. 7	121	663	---	566	349	131	122	---	380	367	572	374	517	695	485	394	422	427	568	399	288	509	---	678	673	401	258	619	453	---	504	519	648	245	704	475	121	663	
Sept. 8	121	663	---	566	349	131	122	---	380	367	572	374	517	695	485	394	422	427	568	399	288	509	---	678	673	401	258	619	453	---	504	519	648	245	704	475	121	663	
Sept. 9	121	663	---	566	349	131	122	---	380	367	572	374	517	695	485	394	422	427	568	399	288	509	---	678	673	401	258	619	453	---	504	519	648	245	704	475	121	663	
Averages	181	652	---	374	466	139	185	577	442	410	495	305	558	746	311	495	598	540	577	522	353	420	---	608	679	607	303	620	607	544	---	455	517	---	442	662	391	181	652
Departures	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sept. 10	286	651	---	544	622	176	283	556	490	549	604	580	631	756	509	373	552	553	559	399	427	536	447	584	614	349	663	573	573	---	608	660	---	488	643	575	286	651	
Sept. 11	153	650	---	396	160	587	126	403	425	529	450	467	497	606	321	582	594	384	463	497	350	499	427	661	610	286	611	541	550	---	561	653	---	382	---	539	153	650	
Sept. 12	94	623	---	396	---	166	365	522	460	372	368	403	575	798	447	547	634	487	381	581	214	435	205	643	402	227	643	447	482	---	475	649	---	377	484	390	94	623	
Sept. 13	68	630	---	389	658	198	208	456	466	319	507	376	419	777	495	610	556	534	560	398	318	430	432	639	413	133	649	527	274	---	606	704	---	557	634	298	68	630	
Sept. 14	127	623	---	408	547	115	204	548	503	504	550	532	419	777	170	402	610	92	518	563	279	498	432	639	413	133	649	527	274	---	581	595	---	574	613	502	127	623	
Sept. 15	155	627	---	426	604	---	115	498	495	181	392	214	605	---	497	488	600	561	464	510	327	164	376	658	364	268	666	539	245	537	554	606	---	513	623	410	155	627	
Sept. 16	219	631	---	336	561	---	101	---	350	255	428	294	594	---	345	313	589	550	509	543	305	415	236	651	659	294	566	560	265	537	569	579	513	547	636	315	219	631	
Averages	158	633	---	380	597	147	263	501	470	376	474	414	560	744	336	457	597	455	490	522	329	409	364	641	476	239	632	534	398	---	565	635	---	463	605	433	158	633	
Departures	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Sept. 17	168	616	---	505	592	---	---	---	74	363	522	336	548	---	64	502	500	491	519	519	547	401	407	---	635	492	---	573	554	---	545	505	---	491	653	282	168	616	
Sept. 18	148	601	---	491	544	---	107	---	462	465	505	421	539	---	318	521	491	283	514	430	265	492	162	628	562	---	573	554	---	545	505	---	491	653	282	148	601		
Sept. 19	137	625	---	496	188	---	117	---	364	491	535	421	516	682	468	358	518	247	524	551	59	455	342	641	584	255	616	541	293	608	318	203	535	98	137	625			
Sept. 20	161	625	---	326	494	---	---	---	116	566	314	343	496	348	588	657	145	213	558	392	515	294	401	362	632	543	152	612	552	348	600	180	354	195	404	161	625		
Sept. 21	176	592	---	562	---	---	62	---	543	486	130	399	105	593	633	329	614	383	518	546	284	110	305	589	364	229	529	468	536	468	548	548	228	455	670	176	592		
Sept. 22	112	555	---	551	203	605	104	---	111	542	446	298	291	273	412	685	344	534	598	566	516	518	317	173	602	589	195	595	565	335	506	514	659	584	467	112	555		
Sept. 23	98	587	---	490	604	202	195	545	197	562	456	477	560	552	329	329	581	518	519	466	408	485	223	601	572	52	623	568	326	595	555	644	400	530	654	98	587		
Averages	143	600	---	414	432	---	118	549	335	379	458	339	537	650	245	398	551	411	518	515	467	287	381	253	618	530	176	534	557	427	513	417	415	656	273	143	600		
Departures	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Sept. 24	57	611	---	292	453	---	144	545	148	546	483	448	349	616	471	312	285	518	482	502	349	472	354	606	571	97	611	562	200	585	524	160	586	487	504	57	611		
Sept. 25	86	605	---	492	52	---	---	---	436	404	487	370	572	656	378	140	550	214	431	515	154	397	429	354	606	572	197	595	545	338	581	260	55	341	625	86	605		
Sept. 26	180	582	---	372	180	---	221	530	397	313	382	459	338	551	696	152	474	516	423	478	522	340	433	259	608	---	198	595	528	430	568	160	55	341	472	180	582		
Sept. 27	158	574	---	372	390	558	---	556	428	313	453	295	366	699	311	376	553	419	460	521	402	303	328	614	363	108	610	508	338	551	247	352	16	503	---	158	574		
Sept. 28	107	587	---	572	372	---	270	538	408	423	225	395	383	383	314	322	398	495	445	476	372	402	222	590	521	128	612	517	324	322	515	620	343	480	599	107	587		
Sept. 29	65	552	---	232	75	---	149	608	425	369	438	362	475	690	213	206	318	498	470	474	317	428	327	608	536	162	604	529	516	537	517	617	541	476	65	552			
Sept. 30	78	588	---	328	328	---	195	556	388	423	416	374	530	645	282	275	502	432	462	502	329	406	265	597	514	135	598	533	374	526	379	301	399	453	608	78	588		
Averages	78	588	---	328	328	---	195	556	388	423	416	374	530	645	282	275	502	432	462	502	329	406	265	597	514	135	598	533	374	526	379	301	399	453	608	78	588		
Departures	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	

Accumulated Departures January 1 to September 30, 1953

[illegible]

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.



# SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langley's.—Continued

SEPTEMBER 1953

1953	Lake Charles, La.	Lander, Wyo.	Las Vegas, Nev.	Lincoln, Neb.	Little Rock, Ark.	Los Angeles, Calif.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBCC)	Madison, Wis.	Medford, Ore.	Miami, Fla.	Newport R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Portland, Me.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	San Antonio, Texas	Santa Maria, Calif.	Saville, N. Y.	Schedelstad, N. Y.	Seabrook, N. J.	Seattle, Wash. (WBAS)	Seattle, Wash. (U. of W.)	State College, Pa.	Stillwater, Okla.	Swan Is., W. I.	Tampa, Fla.	Toronto, Canada	Upton, N. Y.	Washington, D. C. (Silver Hill Obs.)	Winipeg, Manitoba			
Sept. 3-----	375	540	654	171	374	296	369	394	628	320	479	491	516	661	522	632	---	606	560	417	---	---	---	530	300	513	541	565	485	189	617	390	443	407	538	522	260		
Sept. 4-----	299	565	651	479	533	236	439	546	604	574	379	511	408	661	420	642	---	586	587	536	---	---	---	444	344	471	526	535	477	640	602	480	407	490	470	159			
Sept. 5-----	377	633	646	524	562	444	479	560	495	549	397	355	431	640	100	642	---	468	587	590	---	---	---	545	274	458	528	503	156	604	693	724	198	389	491	509			
Sept. 6-----	486	635	612	583	634	456	570	313	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Sept. 7-----	677	426	465	524	629	679	564	568	543	148	340	437	547	606	556	578	---	361	557	608	474	---	---	339	51	251	345	329	167	593	618	544	468	243	52	528			
Sept. 8-----	---	385	513	610	680	512	519	570	490	506	576	580	547	606	556	636	---	441	592	605	---	---	---	287	104	386	117	116	527	585	735	430	340	284	508	199	588		
Sept. 9-----	---	524	575	531	599	651	582	473	568	526	509	594	516	580	529	643	---	562	554	415	597	---	---	573	448	563	502	491	600	---	857	462	510	593	573	301	588		
Averages-----	519	544	588	486	575	517	502	482	568	445	411	458	496	618	439	629	---	458	552	555	548	---	---	469	267	456	433	428	413	526	668	497	391	446	452	351	---		
Departures-----	---	---	---	447	---	---	---	494	---	---	---	---	---	---	---	---	---	---	---	---	448	---	---	---	---	---	---	---	---	425	---	---	---	---	---	---	---		
Sept. 10-----	628	639	609	440	573	642	539	414	560	307	513	554	514	585	591	594	---	632	551	529	593	---	---	571	465	547	517	507	569	---	---	539	456	571	557	252			
Sept. 11-----	580	646	619	524	585	610	439	371	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Sept. 12-----	597	615	612	570	588	663	485	437	546	347	466	467	507	555	513	628	---	612	495	572	543	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Sept. 13-----	577	593	594	513	580	541	529	531	531	388	375	555	590	605	605	608	---	377	525	551	568	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Sept. 14-----	577	561	594	541	570	446	550	413	509	380	480	506	516	575	468	612	---	607	517	585	566	591	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Sept. 15-----	575	560	548	554	577	375	504	469	495	405	145	245	490	578	625	608	---	607	517	585	566	591	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Sept. 16-----	483	365	570	519	559	394	486	528	481	499	426	453	536	558	143	606	---	325	378	379	590	450	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Averages-----	570	569	595	519	576	501	495	452	520	393	403	430	523	581	333	611	---	501	532	549	555	---	---	445	350	479	384	372	398	560	---	417	364	444	499	328	---		
Departures-----	---	---	---	498	---	---	---	102	---	---	---	13	476	---	---	---	---	---	---	---	467	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Sept. 17-----	457	318	556	453	560	396	418	414	535	302	430	558	520	566	148	606	---	436	514	401	517	422	450	545	425	541	336	286	549	550	606	298	341	533	517	318			
Sept. 18-----	570	611	590	306	281	445	447	351	530	281	438	490	492	548	533	610	---	426	493	493	513	321	400	546	433	518	420	358	507	517	607	302	306	363	502	415			
Sept. 19-----	578	553	592	513	568	639	532	485	513	---	402	368	159	582	305	596	---	476	477	563	613	476	487	497	324	452	318	356	130	598	613	380	101	420	353	110			
Sept. 20-----	578	553	599	511	593	430	537	334	515	305	367	305	281	520	437	589	---	362	505	559	596	640	421	405	71	388	464	456	84	519	442	353	332	426	380	197			
Sept. 21-----	584	572	580	532	585	623	530	296	192	352	148	327	480	516	102	577	---	178	496	550	568	622	---	293	197	353	421	402	157	527	199	397	349	433	503	439			
Sept. 22-----	630	548	599	508	606	632	538	502	277	323	303	520	545	515	462	568	---	419	494	494	596	615	588	426	383	515	134	197	457	527	199	397	349	433	503	439			
Sept. 23-----	619	557	604	346	592	632	545	464	506	626	506	453	525	528	515	527	---	589	524	473	423	586	629	588	426	383	515	134	197	457	527	199	397	349	433	503	439		
Averages-----	574	537	589	453	540	544	507	406	438	345	366	442	429	541	359	591	---	415	472	485	564	553	486	459	316	470	328	318	340	536	445	438	334	459	428	362	---		
Departures-----	---	---	---	449	---	---	---	50	---	---	---	10	111	---	---	---	---	---	---	---	103	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Sept. 24-----	499	548	599	328	545	604	522	415	509	357	463	470	363	434	495	600	---	567	486	444	565	651	539	510	417	476	382	376	494	424	549	308	412	441	487	122			
Sept. 25-----	597	557	593	490	500	437	464	402	500	447	369	276	137	524	577	332	---	535	451	522	554	568	651	539	510	417	476	382	376	494	424	549	308	412	441	487	122		
Sept. 26-----	598	538	555	478	509	314	326	394	462	465	416	372	137	524	577	332	---	535	451	522	554	568	651	539	510	417	476	382	376	494	424	549	308	412	441	487	122		
Sept. 27-----	552	546	574	482	593	446	393	467	429	301	257	164	478	532	169	560	---	362	345	472	530	643	541	467	279	159	124	133	410	528	487	177	364	432	343	181	---		
Sept. 28-----	542	541	546	428	467	544	484	415	205	349	400	498	494	529	376	567	---	461	438	473	542	638	541	486	382	481	320	361	484	521	528	497	415	500	487	295	---		
Sept. 29-----	540	530	543	414	517	461	455	345	461	177	408	411	487	517	375	575	---	535	257	489	527	644	543	450	346	429	175	177	448	34	51	446	488	551	280	372	405	466	
Sept. 30-----	566	484	536	484	493	302	401	450	446	267	386	330	476	488	368	543	---	372	250	477	512	621	536	429	258	448	34	51	446	488	551	280	372	405	466	406	---		
Averages-----	555	478	564	444	518	444	435	413	430	337	385	360	355	507	355	573	---	466	360	484	509	630	523	409	334	389	218	229	409	505	499	345	371	397	403	248	---		
Departures-----	---	---	---	482	---	---	---	105	---	---	---	32	448	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Accumulated Departures January 1 to September 30, 1953

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

## ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

SEPTEMBER 1953

Station	Day of month																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
Baltimore, Md.-----	594	568	630	664	471	117	664	726	675	609	624	492	700	560	624	616	644	584	482	453	506	608	608	610	382	435	288	574	531	543		553
Philadelphia, Pa.-----	532	484	516	501	---	315	502	632	632	554	519	267	622	531	495	537	585	495	384	418	424	567	555	504	326	410	---	---	382	453		494
Washington, D. C. (WBCO)-----	576	575	621	525	321	699	615	696	675	640	619	412	639	546	595	606	628	581	285	401	494	578	---	---	---	428	314	546	501	551		543

The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continu-

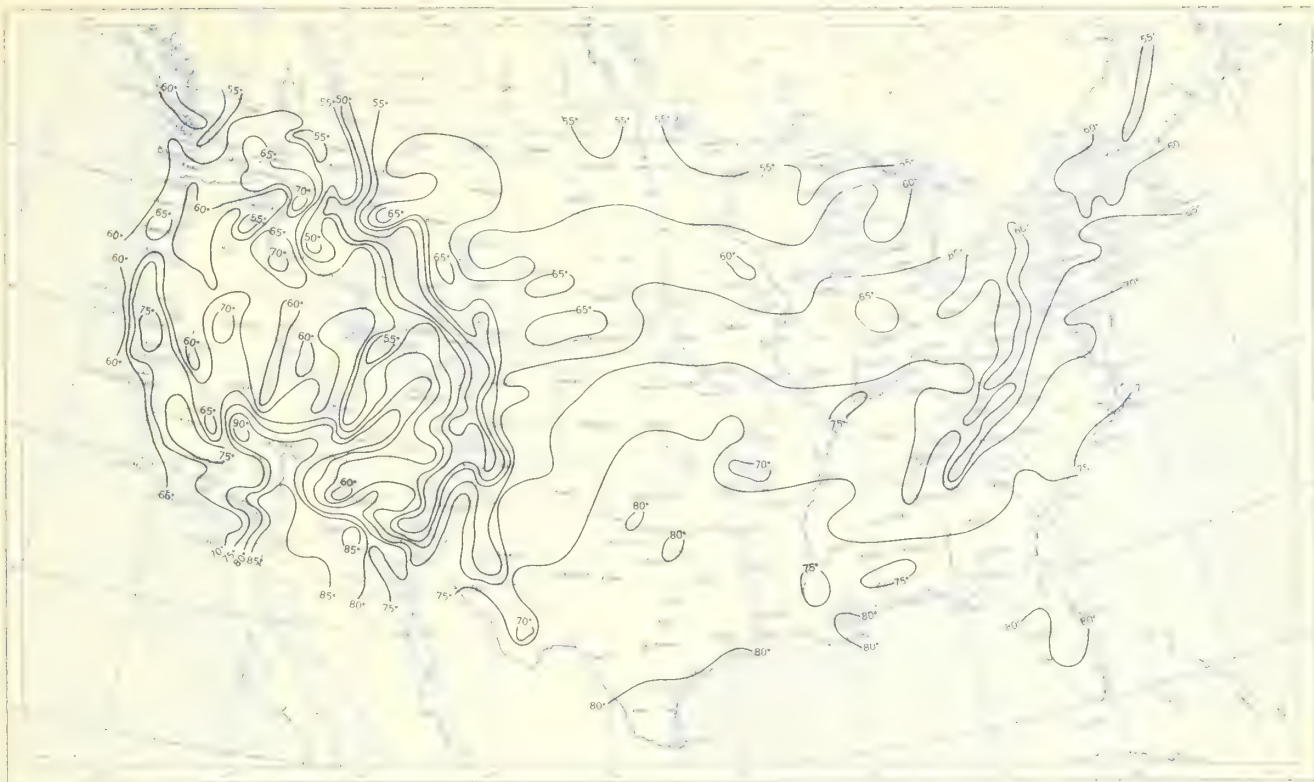
ous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in *Illuminating Engineering*, Vol. XLVI No. 2, pages 59 to 62.

NWRC, Asheville, N.C. --- 12/7/53 --- 2000

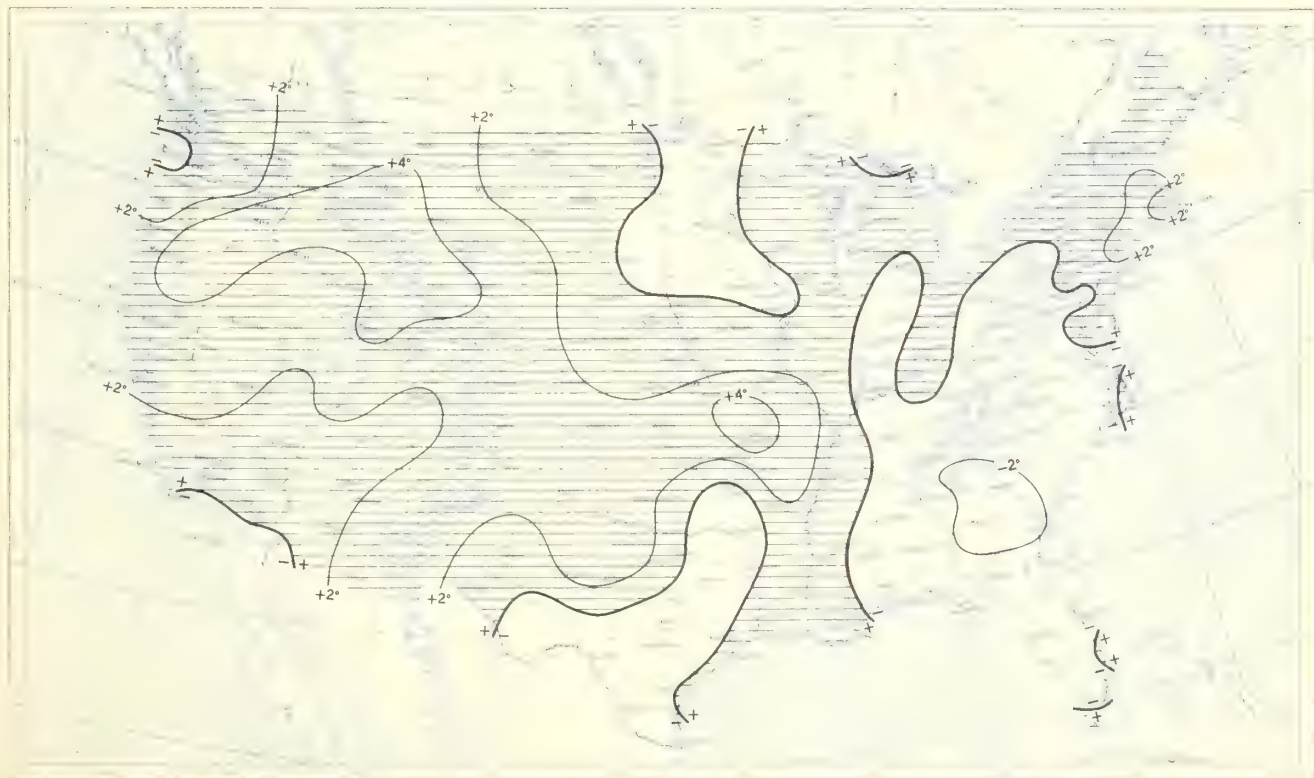




Chart I. A. Average Temperature ( $^{\circ}\text{F.}$ ) at Surface, September 1953.



B. Departure of Average Temperature from Normal ( $^{\circ}\text{F.}$ ), September 1953.



A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.  
 B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.



Chart II. Total Precipitation (Inches), September 1953.



Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), September 1953.



B. Percentage of Normal Precipitation, September 1953.



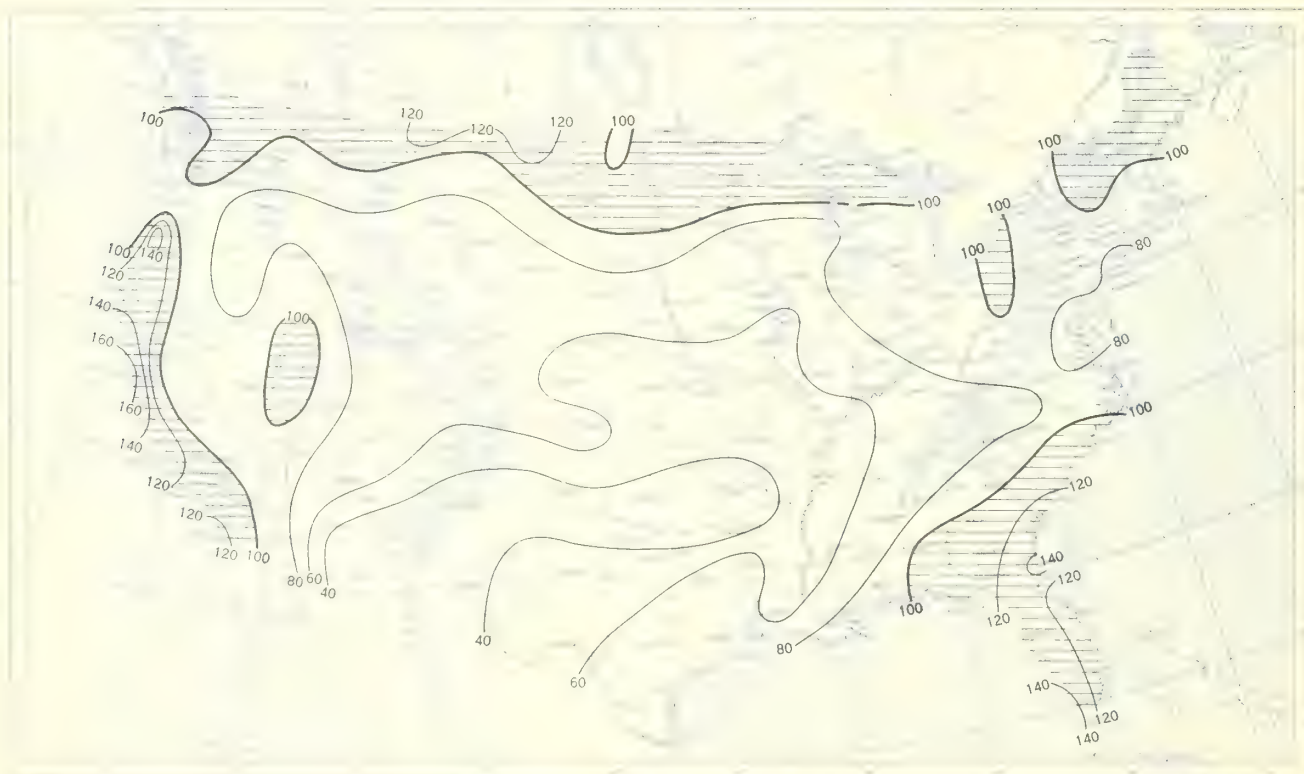
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.



Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, September 1953.

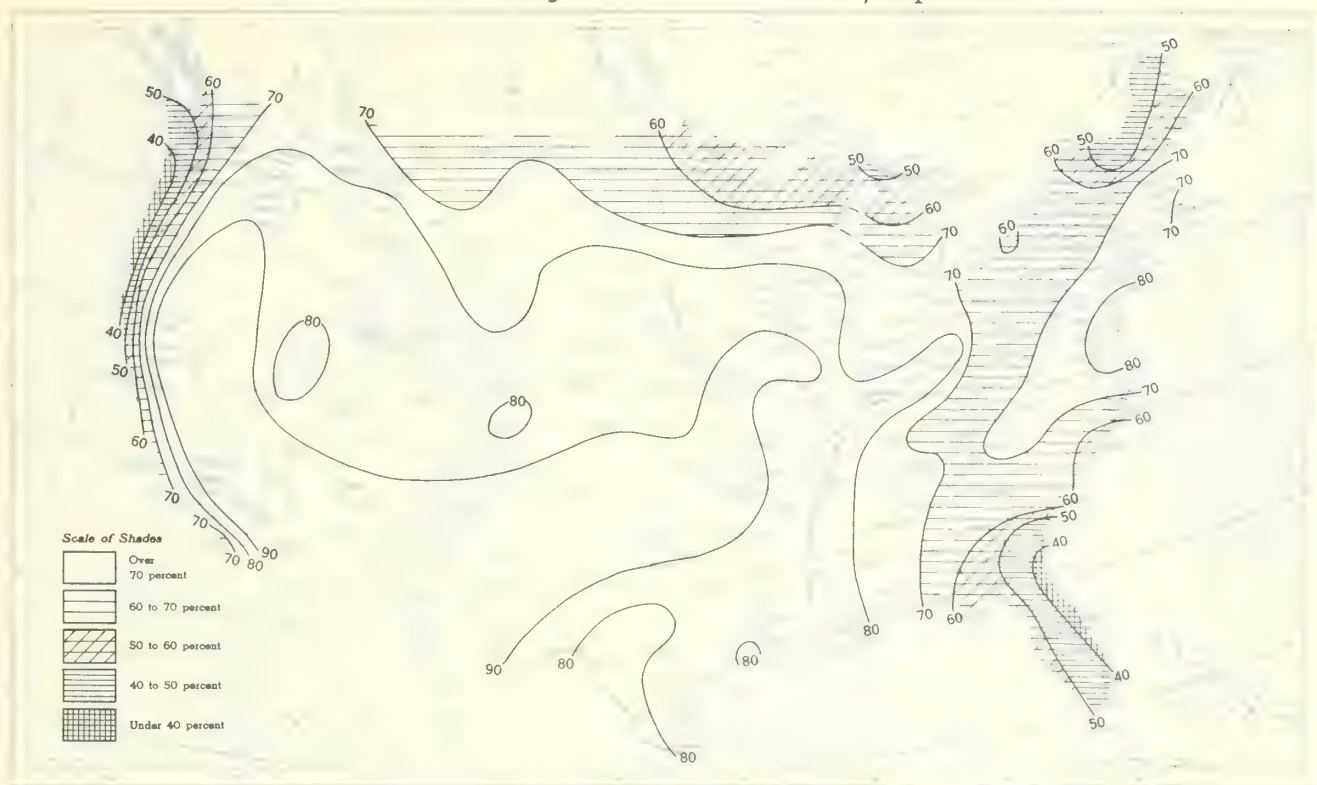


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, September 1953.

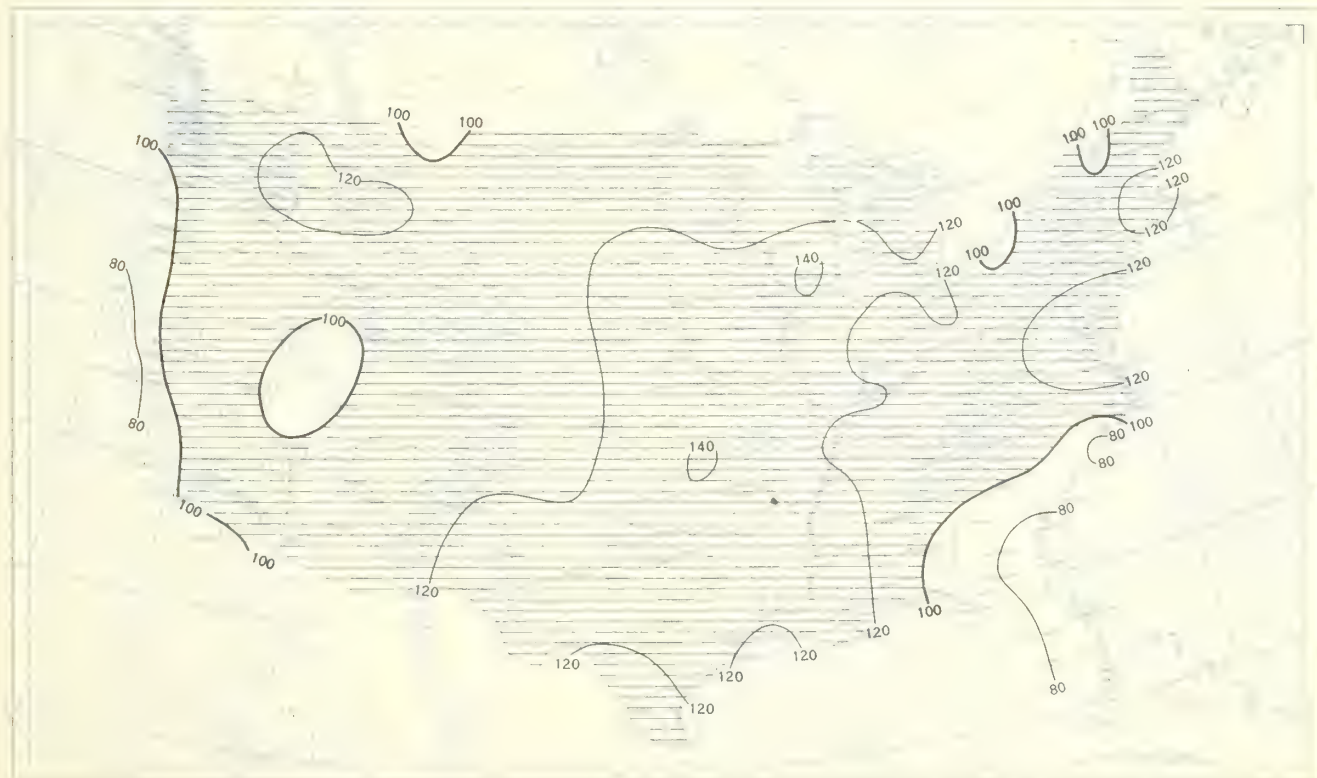


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, September 1953.



B. Percentage of Normal Sunshine, September 1953.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.



Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, September 1953. Inset: Percentage of Normal Average Daily Solar Radiation, September 1953.

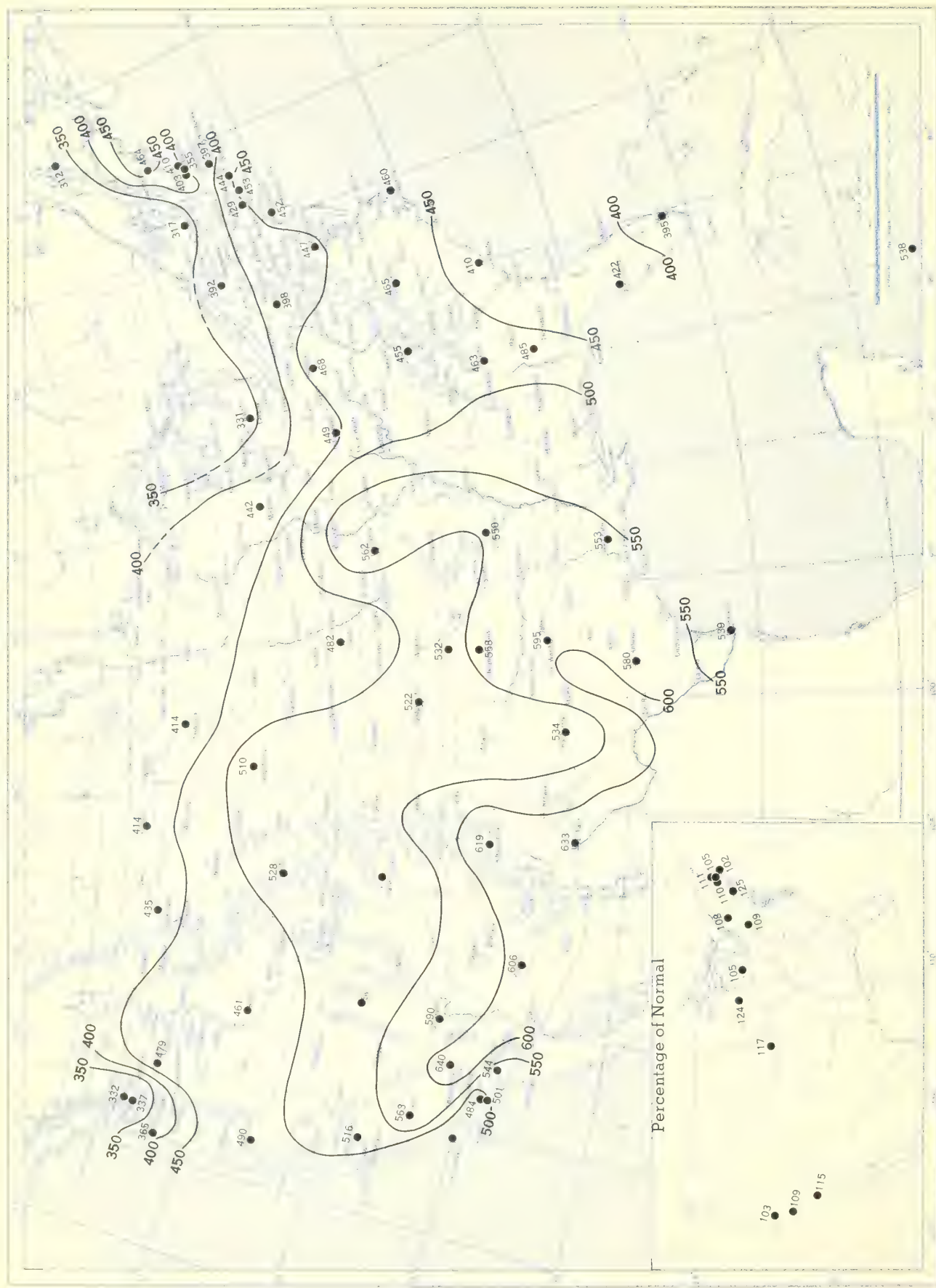


Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.<sup>-2</sup>). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

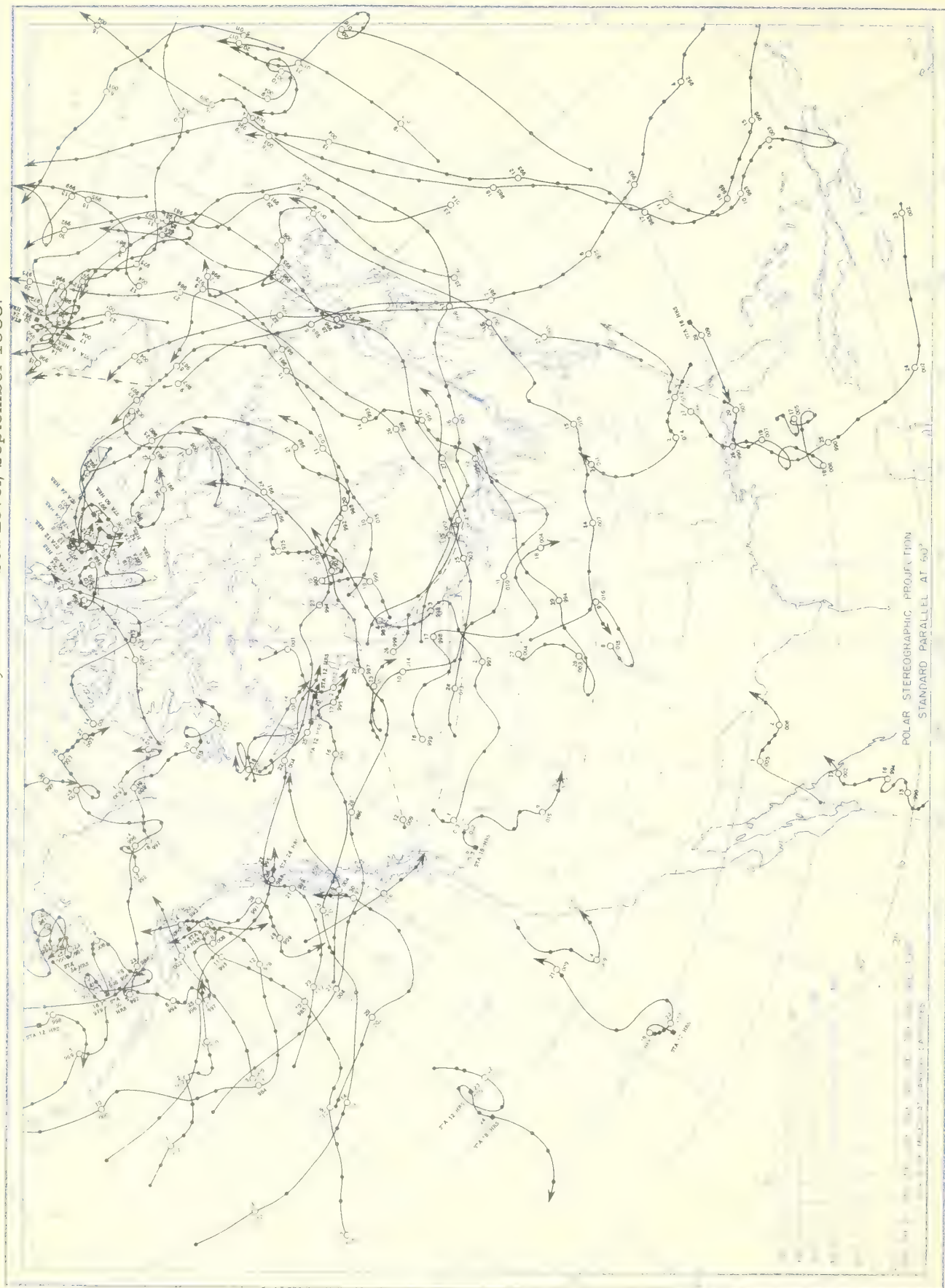
Chart IX. Tracks of Centers of Anticyclones at Sea Level, September 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar.  
Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

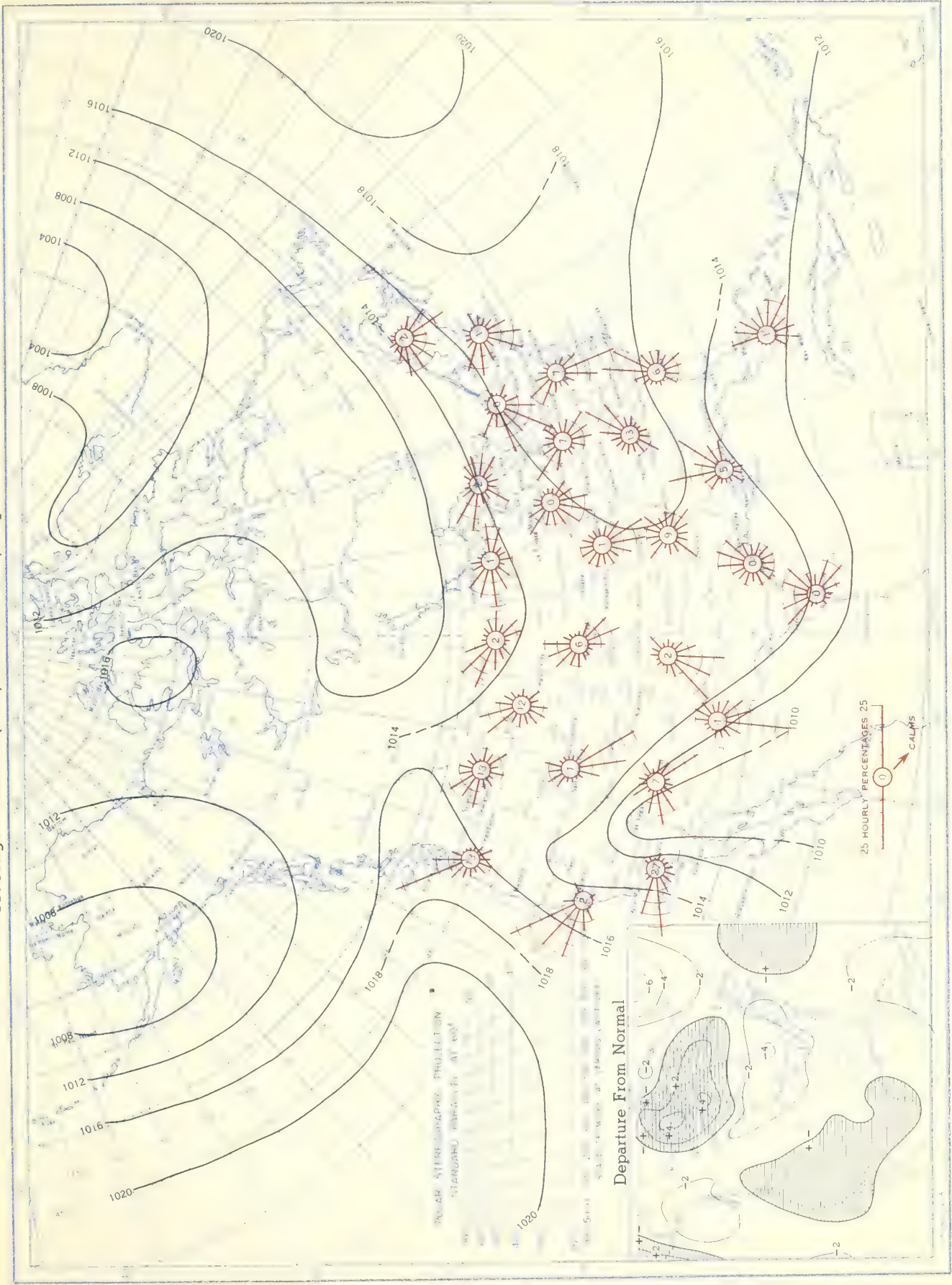


Chart X. Tracks of Centers of Cyclones at Sea Level, September 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

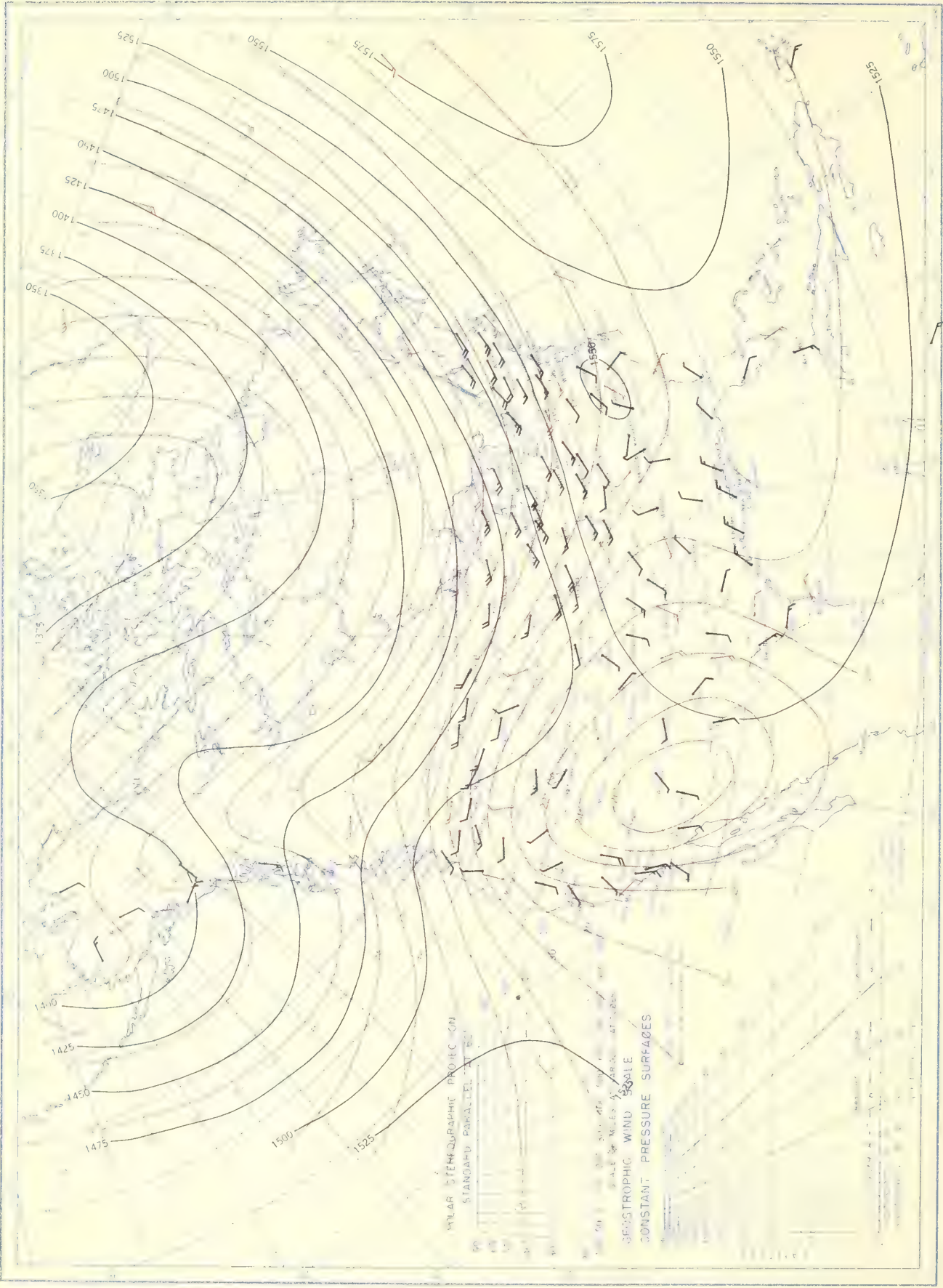
Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, September 1953. Inset: Departure of Average Pressure (mb.) from Normal, September 1953.



Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° inter-sections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

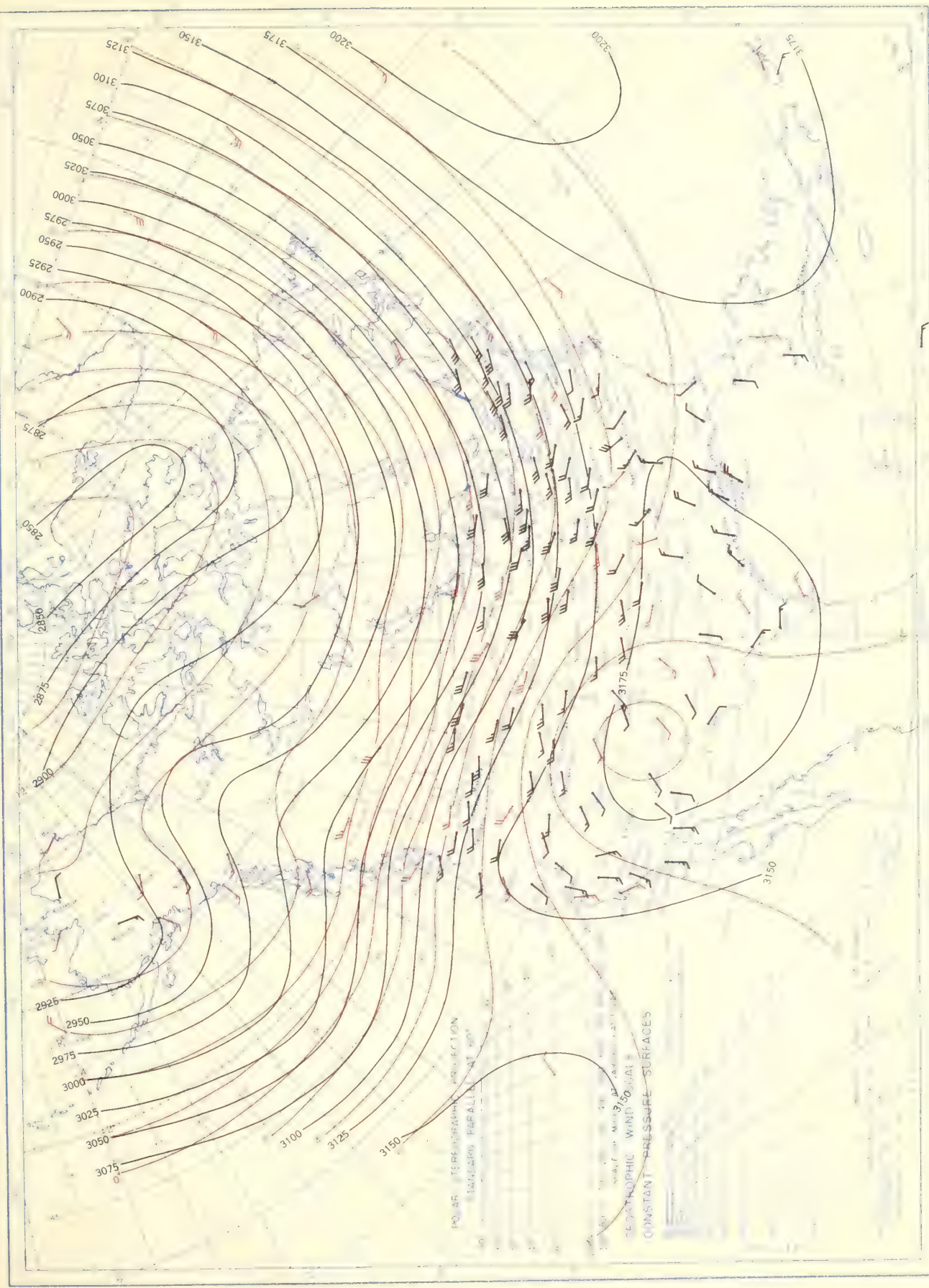


Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), September 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

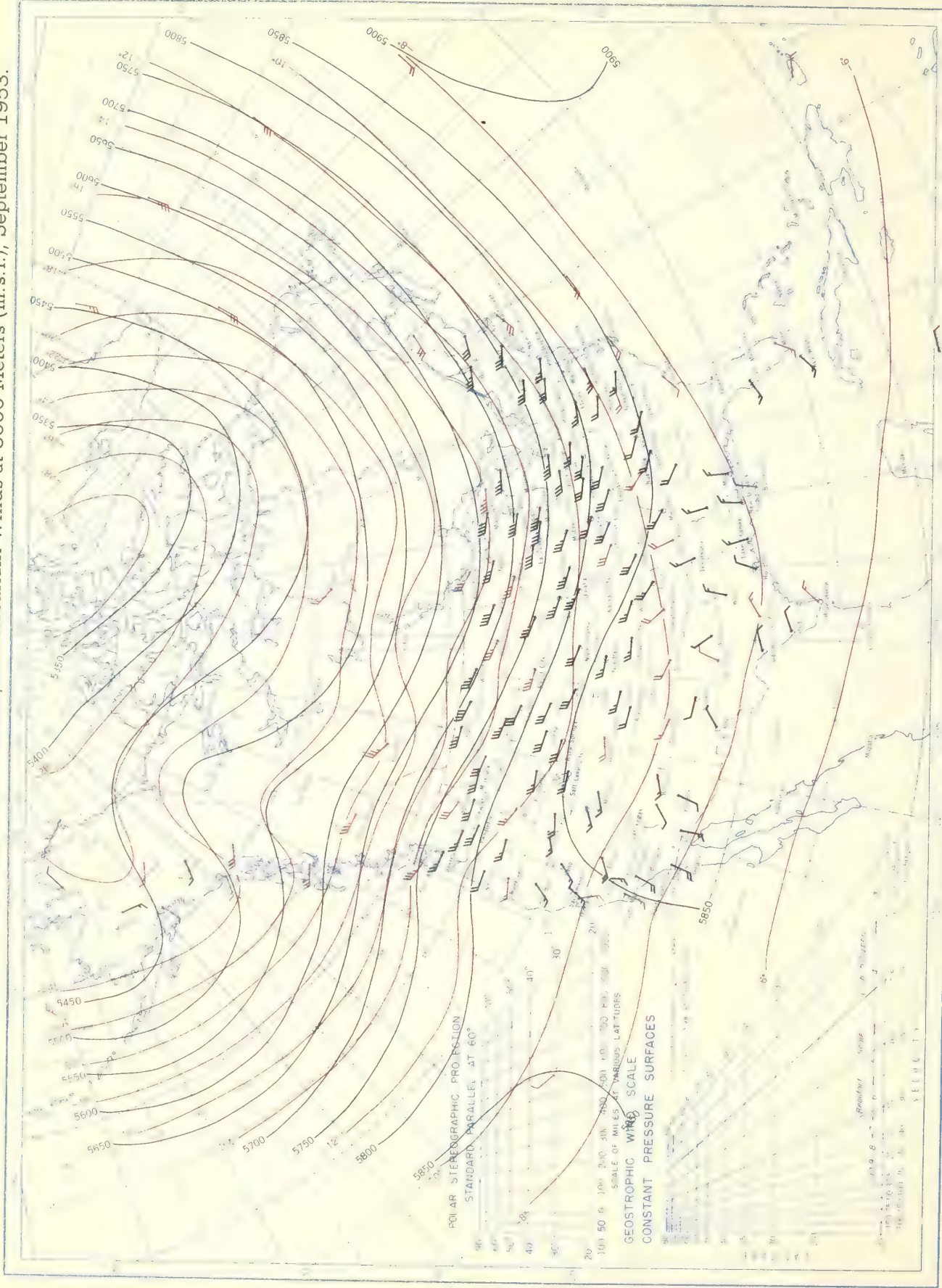
Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), September 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

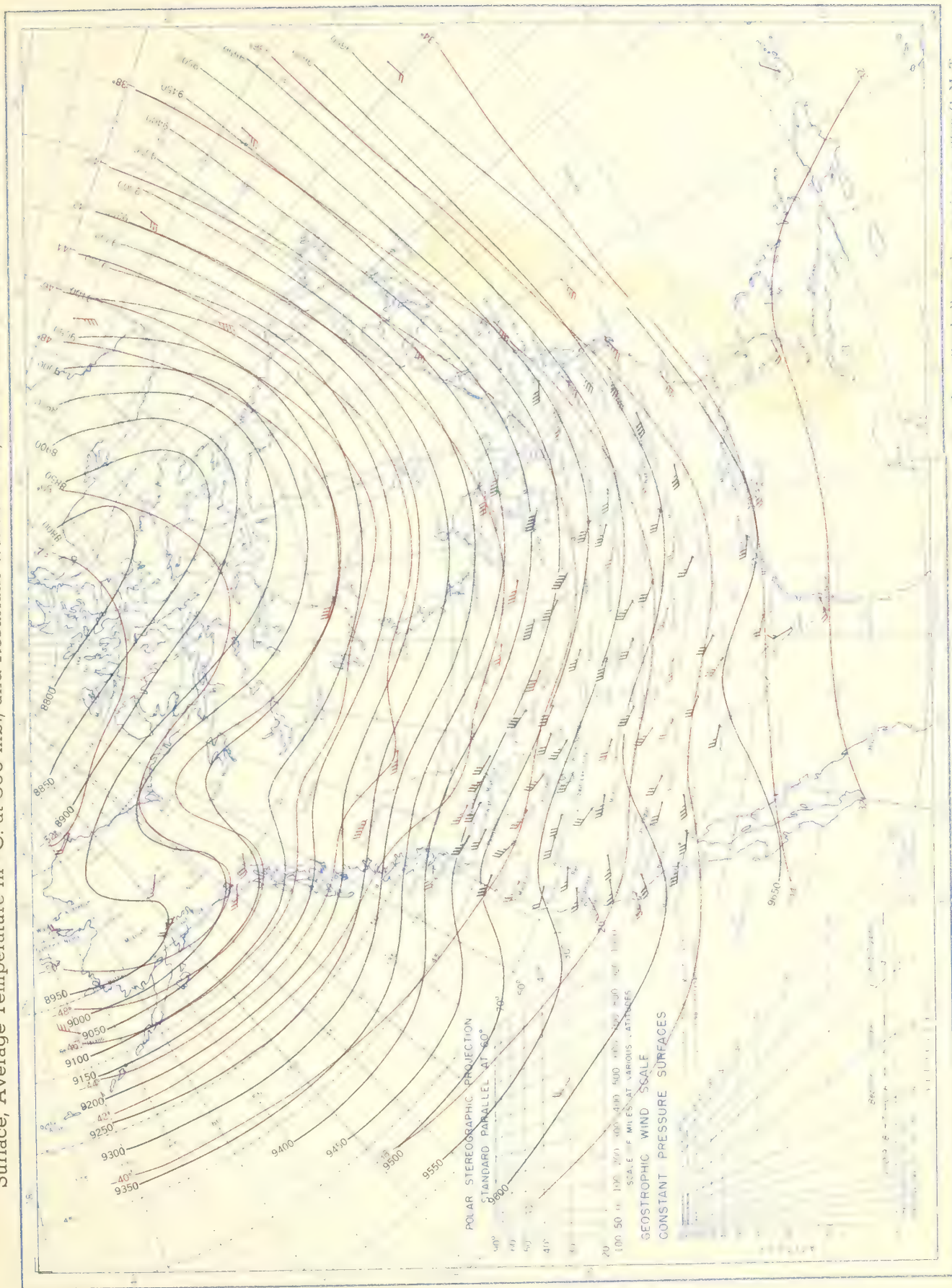


Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), September 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.90 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), September 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.



U. S. Department of Commerce WEATHER BUREAU NWRC - Asheville, N. C.	OFFICIAL BUSINESS Permit No. 1024
---	--------------------------------------

Clemson College  
Clemson  
South Carolina

CD

Penalty for private use to avoid pay- ment of postage \$300.
---

U. S. DEPARTMENT OF COMMERCE

SINCLAIR WEEKS, Secretary

WEATHER BUREAU

F. W. REICHELDERFER, Chief

# CLIMATOLOGICAL DATA

NATIONAL SUMMARY

OCTOBER 1953

Volume 4 No. 10





# C O N T E N T S

SURFACE DATA	Page
General Summary of Weather Conditions-----	327
Condensed Climatological Data - States-----	329
Climatological Data - Stations-----	330
Heating Degree Days-----	334
Severe Storms-----	335
General Summary of River and Flood Conditions-----	337
Flood Stage Data-----	337
UPPER AIR DATA	
Radiosonde Data-----	338
Pilot Balloon Data-----	341
Rawin Data-----	342
SOLAR RADIATION DATA	
Solar Radiation Intensities-----	343
Blue Hill Data-----	344
Daily Totals and Average Daily Totals by Weeks-----	345
Daily Illumination on a Horizontal Surface-----	347
CHARTS I-XV	

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

SUBSCRIPTION PRICE: Monthly and annual, 15 cents per copy; yearly subscription, including monthly and annual issues, \$1.50. Checks and money orders should be made payable to the "Superintendent of Documents." Remittance and correspondence regarding subscriptions should be sent to "Superintendent of Documents, Government Printing Office, Washington 25, D. C."

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

Volume 4 No. 10

OCTOBER 1953

### GENERAL SUMMARY OF WEATHER CONDITIONS

October 1953 was unusually warm, dry, and sunny. The nationwide temperature average remained above normal, and the precipitation average below normal, for the fifth consecutive month, and abundant sunshine over almost the whole Nation exceeded 180% of normal in the North-Central interior where record amounts for October were reported at several stations.

As extremely dry weather, which began early in September, persisted through the first 3 weeks of October, drought continued to affect most of the Nation. Among the worst results were numerous forest and brush fires in Alabama, Louisiana, and Minnesota, critical water shortages in many localities of the central Gulf States and in a belt extending from extreme eastern Kansas to the Appalachians, delayed growth of fall grains in most sections east of the Rockies, and deterioration of ranges in the far Southwest. The dry weather, however, was excellent for harvesting operations, which were completed much earlier than usual; for instance, the picking and cribbing of corn were completed 3 weeks earlier than usual in the main Corn Belt.

Following this dry spell rather general light to locally heavy showers, which began in the far West, spread across the Nation, ending the drought in Texas, Oklahoma, and the north Atlantic coastal areas and bringing at least some relief to most of the remaining drought areas.

**PRECIPITATION.**--Between the Mississippi and the eastern Seaboard (except east and south Florida and the New England coast) October rainfall generally was less than 50% of normal. In the upper Mississippi Valley and much of the Southeast it was generally less than 25% and locally less than 10%. The Statewide average for North Carolina, 0.52 inch, was the lowest for October on record, and several stations in the State reported no measurable precipitation during the entire month, and only a few localities had as much as an inch. Also, 10 stations in South Carolina and 1 or more in Georgia, Alabama, and Mississippi had no rain at all. Florence, S. C., reported no rain for the driest October since 1882, and Charlotte, N. C., received only a trace which was the least in 76 years of record.

Similar dry conditions existed in the far West. Monthly totals exceeded an inch only along the north Pacific Coast and the adjacent Cascade and northern Sierra Nevada Mountains, and in scattered localities of the central Rocky Mountain region. There was little or no precipitation in the Southwest, where ranges continued to deteriorate. In Arizona, for instance, the State average for October was only 0.19 inch, most of which fell between the 18th and the 23d, and for September and October combined only 0.21 inch, a record low for this 2-month period.

In Texas and Oklahoma, locally heavy rains the first week and again about the middle of the month, and rather general moderate to heavy rains during the fourth week either effectively broke or greatly relieved the prolonged drought. Owing

to the heavy rains in Texas during the last week, soils in many sections became too wet to work, but crop prospects were the best in several years. Statewide averages for both States exceeded 150% of normal and individual point values ranged up to 11.51 inches in Eldorado, Okla., and 11.30 inches at Jarrell, Tex. The monthly average for Oklahoma (4.55 inches) was the highest since the record October value of 11.47 inches in 1941. Dry-planted wheat in northwestern Texas was coming up at the end of the month and ranges in the western portion of the State were greening.

In Atlantic coastal sections from central Virginia northward 1- to 3-inch rains from the 27th to the 29th brought considerable relief from the dry spell. The fire hazard was relieved, topsoil moisture became at least temporarily adequate, and in New England a water shortage that began in June was alleviated.

In Florida, Georgia, and southeastern Alabama the soil moisture situation remained favorable, due to previous rains, even though October rainfall in many sections was less than 25% of normal.

**TEMPERATURE.**--October temperatures averaged near normal west of the Continental Divide and in the South, but above normal elsewhere with greatest departures of 7° or more occurring at stations between the Great Lakes and the Continental Divide. In the latter area October averages for many stations were the highest on record; 53.1° at Havre, Mont., was the highest average there in 74 years. The Statewide average of 51.9° for North Dakota was also a new record.

During a 3-day heat wave at the beginning of the month in northern areas east of the Continental Divide, maximum temperatures rose to record high levels for so late in the season. Some of the highest temperatures recorded were 97° at Miles City, Mont., and Watford, N. Dak., on the 1st; 95° at Wheaton, Minn., and 93° at Hatfield, Wis., on the 2d; and 91° at Wayne and Willis, Mich., and 89° at Dansville, N. Y., on the 3d. In the Ohio Valley and Great Lakes Region maximum temperatures rose to record seasonal heights again on the 19th to the 22d at many stations, a few of which are: Grand Rapids, Mich., 85°; Cleveland, Ohio, 83°; Chicago, Ill., 87°; and Louisville, Ky., 88°. The highest temperatures occurred during the first week, except in north-central Montana and the western portion of the lower Great Plains where they occurred on the 10th. The month's highest temperature, 107°, was recorded in Arizona at Mesa Experiment Farm on the 1st.

The lowest temperatures occurred during the last decade except at a few stations in the central Great Basin of the far West on the 4th, and in the Virginias, the eastern Lake Region, and the middle Atlantic and New England States either on the 8th or 14th. The lowest temperature recorded during the month was -1° at Dillinger, Wyo., on the 21st.

Killing frosts this October were generally later than usual, occurring in most middle sections of



## GENERAL SUMMARY OF WEATHER CONDITIONS—Continued

OCTOBER 1953

the Country late in the month and, owing to this later-than-usual occurrence and the early maturity of crops, no frost damage was reported.

**SNOWFALL.**--Measurable snowfall during October generally was limited to high elevations in the far West, to a few scattered localities in the upper Great Lakes, and to northern New York and New England. In the latter areas most of the month's total occurred on the 7th and 8th when up to 6 inches were measured during an unusually heavy snowstorm for so early in the season. A rather general 5-inch fall of heavy, wet snow over Aroostook County, Maine, during this storm damaged utility lines. At Caribou, Maine, where 3.5 inches fell, this was the heaviest October storm on record.

In the far West the principal snowfall occurred from about the 18th to the 23d. Heavy falls in the central and northern Rocky Mountains on the 21st and 22d measured up to 22 inches at Edgar, Mont., and about a foot in the Big Horn Mountains of Wyoming. In the latter area and also in a few mountain sections of Colorado the heavy snow trapped a number of hunters, some for as long as 5 days. At Pocatello, Idaho, 6.5 inches (a new 24-hour record for October) fell on the 21st.

**DESTRUCTIVE STORMS.**--Most of the month's storm damage occurred when a tropical disturbance crossed

the southern portion of the Florida Peninsula on the 9th. As a result of above-normal rainfall in this area since May, the soil was saturated, lakes were full, and some streams, particularly the St. Johns and Kissimmee Rivers, were already overflowing at the end of September. The 3- to 5-inch rains which fell during the passage of this storm augmented these flood conditions, and the resulting damage which included the total loss of some plantings, and damage to roads, sewers, and drainage systems was estimated to be at least \$9,000,000. Additional losses by winds, which were slightly below hurricane force, and one or more tornadoes that occurred during the storm, were placed at \$250,000.

The second worst storm of the month occurred in the Houston, Tex., area on the 26th when line squall winds (gusts up to 80 m.p.h.) damaged aircraft at the Municipal Airport to the extent of \$1,500,000 and caused additional property losses of \$500,000.

Strong winds in the lower San Joaquin Valley of California on the 18th and 21st resulted in an estimated \$300,000 loss of growing lima beans, and on the 23d snow and wind caused considerable damage (\$100,000 according to press reports) between Provo and Ogden, Utah.

# CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

OCTOBER 1953

Section	Temperature								Precipitation							
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes					
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least		
	*F.	*F.		*F.			*F.		In.	In.		In.		In.		
Alabama	66.2	+1.3	Atmore State Farm	96	4	Valley Head	25	30	0.57	-1.95	River Falls	1.56	2 Stations		0.00	
Arizona	61.7	-.1	Mesa Exp. Farm	107	1	Maverick	9	25	.19	-.62	Lukachukai	1.44	43 Stations		.00	
Arkansas	61.8	+1.9	Ozark	104	1	Gilbert	25	30	1.48	-1.75	Siloam Springs	4.08	Washita		.50	
California	61.0	.0	4 Stations	106	9	Boca	15	3	.74	-.56	Crescent City 8NE	8.51	119 Stations		.00	
Colorado	49.4	+1.9	Sedgwick	95	2	Platoro Dam	0	25	1.23	.00	Ames	4.82	Greely		.08	
Connecticut	54.0	+1.9	Kent	84	3	2 Stations	18	14	4.63	+1.13	New London	6.92	Bridgeport WB AP		3.31	
Delaware	58.5	+1.0	Delaware City	86	1	Wilford	28	14	4.00	+.91	Wilford	6.93	Willisboro		2.44	
Florida	72.0	-.9	De Funiak Springs	92	13	2 Stations	35	30	5.48	+1.21	Pompano Beach	20.44	Cedar Key		T	
Georgia	66.1	+7.7	La Fayette	95	1	Blairsville Exp. Sta.	26	31	.79	-1.88	Folkston 35SW	4.20	Dallas		.00	
Idaho	49.4	+2.0	Mountain Home	93	9	3 Stations	12	92	.48	-.94	Burke 2NNE	1.87	Challis		.00	
Illinois	59.5	+3.6	2 Stations	98	2	Sycamore	22	29	1.56	-1.11	Wt. Carmel Wtr. Wks.	4.09	Galena		.31	
Indiana	58.2	+3.0	Evansville	97	2	2 Stations	31	30	1.31	-1.46	Petersburg 66 Bridge	3.15	Salamonia		.52	
Iowa	58.1	+5.6	4 Stations	96	2	do	19	28	.48	-1.81	Emerson 5NE	2.60	Britt		.00	
Kansas	60.8	+3.1	Sedan	98	1	4 Stations	24	94	1.71	-.32	Longton	5.65	Lincoln		.06	
Kentucky	60.2	+1.7	2 Stations	98	1	West Liberty Wtr. Wks.	20	30	.91	-1.68	Lovellsville	2.62	Paintsville		.13	
Louisiana	69.0	+.9	do	99	92	Tallulah Delta Lab.	26	30	1.29	-2.11	Oakdale	3.61	2 Stations		T	
Maine	48.5	+.6	Hiram 2S	84	4	Millinocket	18	18	4.53	+.96	Belfast	6.23	Caribou WB AP		1.71	
Maryland	58.2	+1.8	2 Stations	98	1	Oakland	17	8	2.65	-.32	Charlotte Hall	4.97	Frostburg		.40	
Massachusetts	53.4	+1.6	do	87	4	2 Stations	19	14	5.18	+1.81	Southbridge 3E	7.57	Pittsfield WB AP		3.25	
Michigan	53.0	+4.2	do	91	3	do	18	97	1.37	-1.28	Greenville	3.09	2 Stations		.46	
Minnesota	53.6	+7.6	Wheaton	95	2	do	17	96	.57	-1.27	Angus 1NE	1.94	Farmington 3NW		T	
Mississippi	66.6	+1.1	Eupora	99	13	Newton Exp. Sta.	23	30	.63	-1.85	Cleveland	2.16	4 Stations		.00	
Missouri	61.1	+3.4	Clearwater Dam	99	3	Bethany	21	29	2.02	-.92	Grove Springs	5.50	2 Stations		.15	
Montana	49.9	+4.4	Miles City	97	1	Osando 7NNW	4	23	.72	-.27	Edgar 10SE	3.36	4 Stations		.00	
Nebraska	56.9	+4.9	Cambridge	97	2	Fort Robinson	16	26	.99	-.46	Wellfleet	3.05	Agate		T	
Nevada	52.0	+.2	Overton	102	2	Virgin Valley	11	25	.53	-.12	Lehman Caves NW	2.90	Las Vegas		.00	
New Hampshire	49.5	+1.9	Blackwater Dam	87	4	7 Stations	19	99	3.97	+.85	East Dearing	5.75	North Stratford		2.22	
New Jersey	56.8	+1.9	3 Stations	87	1	Newton	21	14	3.70	+.24	Belle Plain	6.32	Sandy Hook		2.35	
New Mexico	55.2	.0	Carlsbad	97	1	Luna RS	4	27	.93	-.18	Hobbs	4.82	2 Stations		T	
New York	51.4	+1.5	Elmira	92	1	Speculator	11	14	2.37	-.85	Port Jervis	6.43	Buffalo WB AP		.32	
North Carolina	62.1	+1.4	Hot Springs	92	2	Celo 2S	21	31	.52	-2.66	Clingmans Dome	3.57	2 Stations		.00	
North Dakota	51.9	+7.9	Watford City 14S	97	1	Moffitt 4SE	12	6	1.10	+.06	Columbus	2.68	do		.25	
Ohio	56.6	+2.7	McConnellsville Lock 7	98	1	2 Stations	21	98	.74	-1.71	Cincinnati Hartwell	1.89	Prospect		.18	
Oklahoma	64.4	+1.3	Wilburton	101	1	Smithville	27	30	4.55	+1.59	Eldorado	11.51	Spencerville		T	
Oregon	50.7	+.4	John Day	90	7	Seneca	10	3	1.80	-.42	Otis	7.20	Warm Springs Res.		.07	
Pennsylvania	54.4	+1.7	Huntington 1WNW	97	1	Donegal	17	8	1.99	-1.16	Matamoras	6.38	Meadville 1S		.14	
Rhode Island	54.1	+.7	Greenville	79	3	Kingston	22	14	4.91	+1.50	Greenville	5.56	Block Island WB AP		4.64	
South Carolina	65.1	+.9	5 Stations	90	91	Long Creek 1N	30	30	.50	-2.32	Walhalla	3.84	10 Stations		.00	
South Dakota	55.1	+6.2	2 Stations	98	1	Deerfield Dam	9	23	.82	-.39	Wobridge	2.86	Iroquois		.03	
Tennessee	61.6	+1.7	do	99	91	Waynesboro	23	30	.78	-2.00	Brownsville	2.53	3 Stations		.11	
Texas	67.5	+.7	Boquillas Ranger Sta.	103	13	Dalhart Exp. Sta.	29	27	3.63	+1.18	Jarrell	11.30	Marathon		.14	
Utah	50.6	+1.2	Hite	99	2	Silver Lake Brighton	8	22	1.09	-.12	Montezuma Creek	4.39	Park Valley		.04	
Vermont	48.7	+1.6	4 Stations	83	93	3 Stations	17	14	2.97	-.24	Ways Mill	5.19	Middlesex		2.08	
Virginia	59.5	+2.0	Luray	97	1	Burkes Garden	20	8	1.76	-1.15	Concord SS	6.11	Wallaceton Lk. Drummond		.15	
Washington	51.4	+1.3	Trinidad 2SSE	85	8	Harrington 1N	17	24	2.53	-.25	Spruce	15.00	White Swan		T	
West Virginia	56.3	+1.5	Brownsville	99	1	2 Stations	16	8	.84	-1.89	Pickens 1	2.57	Huntington WB City		.22	
Wisconsin	54.0	+6.2	Hatfield Dam	93	2	Coddington 1E	11	29	.40	-1.98	Madison WB AP	1.81	2 Stations		.00	
Wyoming	47.7	+3.3	Hulett	95	1	Bondurant	2	3	.54	-.61	Sunshine 4SW	1.81	Weston		.00	
Puerto Rico	78.0	-.1	Aguirre (5)	95	92	Garzas Dam	52	27	8.33	+.68	Maricao	27.26	San Lorenzo (Valdes)		2.49	

\* Other dates also.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding

that shown. (See individual Climatological Data for times of observations).



## CLIMATOLOGICAL DATA

OCTOBER 1953

Table

State and station	Elevation (ground)	Pressure		Temperature										Precipitation										Wind				No. of days							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days	No. 90° F or above	Min 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	0.1 inch or more	With thunderstorms	Total	Snow, Sleet, Hail	Max depth on ground	Average hourly speed	Prevailing direction	Fastest mile	No. of days							
																												Direction	Speed	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
Ft	Mb	Mb	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	In	In	In	In	In	In	In	In	M p. h.	M p. h.			0-3	4-10	8-10	%				
ALABAMA																																			
Birmingham	610	994.2	1019.5	80	51	65.2	+1.5	90	12	31	30	1	1	49.62	0.21	-2.65	0.18	2	0	0.0	0	0	7.2	ENE	26	W	28	20	9	2	2.8	86			
Mobile	211	1010.5	1018.4	82	58	69.9	+7.8	89	13	37	30	0	0	56.69	.18	-3.05	.18	1	1	0	0	0	9.1	N	---	---	---	23	5	3	3.4	---			
Montgomery CO	201	-----	-----	80	57	68.3	+7.0	89	13	40	30	0	0	---	.40	-1.75	.27	2	0	0	0	0	---	---	---	---	---	---	---	---	---	---	---		
Montgomery	198	1010.8	1018.2	81	54	67.2	+8.8	89	13	37	31	0	0	54.70	.48	-1.88	.29	2	0	0	0	0	3.9	NE	23	W	28	18	11	2	3.0	77			
ARIZONA																																			
Flagstaff	6993	-----	-----	83	27	44.9	-1.2	76	1	16	25	0	26	---	---	.49	-.97	.30	4	2	0	T	T	---	---	---	---	---	---	---	---	---	---	---	
Phoenix CO	1083	-----	-----	89	59	73.5	+1.4	102	1	46	24	16	0	---	---	-.40	T	0	0	0	0	6.2	---	24	SE	22	22	4	4	2.3	---	93			
Phoenix	1114	973.6	1012.4	87	56	71.6	+8.100	1	43	25	14	0	0	40.35	T	-.40	T	0	0	0	0	4.8	E	*25	SSE	22	25	5	1	1.7	---	---			
Prescott	5014	988.0	1015.2	73	39	56.4	-6.8	87	1	25	24	0	5	24.33	.01	-.67	.01	1	0	0	0	8.5	SW	42	SE	22	24	6	1	1.8	91				
Tucson	2558	925.2	1012.3	86	56	71.0	+1.4	98	1	42	25	12	0	28.23	T	-.47	T	0	1	0	0	8.2	SE	37	E	6	25	5	1	1.7	95				
Winslow	4880	852.7	1015.3	74	39	56.4	+1.8	89	1	27	27	0	0	22.30	T	-.55	T	0	0	0	0	7.7	SE	*36	SW	19	23	5	3	1.9	---	---			
Yuma	199	1006.1	1011.3	92	61	76.4	0	104	9	50	24	21	0	33.24	T	-.32	T	0	0	0	0	6.2	N	26	N	3	28	3	0	.8	98				
ARKANSAS																																			
Fort Smith	458	1002.0	1018.7	79	51	65.0	+1.1	96	1	34	29	3	0	49.62	1.02	-2.61	.74	5	1	0	0	7.0	NE	29	E	25	16	10	5	3.6	67				
Little Rock	257	1005.8	1018.9	79	53	66.3	+2.2	94	1	36	30	5	0	49.60	1.02	-1.79	.52	3	0	0	0	5.8	NE	21	E	2	16	7	8	3.9	75				
Texarkana	361	1005.1	1018.6	81	55	68.0	+1.0	95	1	39	30	5	0	52.59	.78	-2.60	.69	3	2	0	0	---	---	---	---	---	---	---	---	---	---	---	---		
CALIFORNIA																																			
Bakersfield	489	998.3	1016.3	81	50	65.4	-1.1	99	7	41	22	7	0	41.43	.02	-.35	.02	1	0	0	0	3.9	ENE	*28	NW	18	27	3	1	1.4	---	---			
Bishop	4108	875.0	1015.6	75	35	55.1	-2.0	87	6	24	24	0	12	---	---	-.12	-.22	.09	3	0	0	0	---	---	---	---	---	---	---	---	---	---	---		
Blue Canyon	5280	840.8	1016.6	61	44	52.5	-6.7	78	7	32	18	0	2	---	---	3.25	+0.08	2.53	2	1	3.4	2	---	---	---	---	---	---	---	---	---	---	---		
Burbank	699	988.2	1014.3	82	52	67.1	+2.0	101	5	42	24	7	0	43.48	T	-.52	T	0	0	0	0	3.2	S	*30	NNW	19	24	5	2	1.9	---	---			
Eureka CO	43	1016.9	1019.3	61	48	54.5	+3.7	77	4	41	22	0	0	---	---	3.84	+1.14	1.86	6	0	0	0	5.4	---	31	N	20	12	6	13	5.3	57			
Fresno	331	1003.7	1015.4	80	47	63.3	-.8	96	7	38	22	6	0	45.55	.18	-.48	.18	1	1	0	0	4.6	NW	31	NE	21	23	7	1	2.2	94				
Los Angeles CO	312	-----	-----	81	58	69.1	+2.5	101	5	50	23	6	0	47.54	T	-.50	T	0	0	0	0	6.0	---	---	---	---	---	---	---	---	---	---	---		
Los Angeles	99	1010.5	1014.1	76	55	65.2	+1.8	101	4	48	24	3	0	51.67	T	-.43	T	0	0	0	0	5.7	WSW	*42	N	19	22	6	3	2.4	---	---			
Mt. Shasta	3543	895.0	1019.4	65	37	51.0	-0.8	83	6	27	24	0	5	---	---	1.59	-1.02	1.05	4	0	0	0	---	---	---	---	---	---	---	---	---	---	---	---	
Oakland	3	1016.6	1017.0	72	48	59.9	-1.9	91	5	43	20	2	0	48.71	.35	-.56	.12	4	0	0	0	5.4	NNW	*40	NNE	21	18	10	3	3.1	---	---			
Red Bluff	341	1004.1	1016.8	78	50	64.2	-.9	96	6	41	24	5	0	39.44	.58	-.91	.34	4	0	0	0	9.2	NNW	32	NW	19	17	6	8	3.8	87				
Sacramento	17	1015.2	1016.0	77	48	62.2	-.5	91	5	38	25	4	0	43.54	.32	-.59	.27	2	0	0	0	8.0	NNW	53	N	21	21	7	3	2.6	86				
Sandberg CO	4517	863.5	1014.9	68	48	57.5	-.8	85	5	35	19	0	0	27.37	.01	-.65	.01	1	0	0	0	16.0	NW	---	---	---	---	---	---	---	---	---	---		
San Diego	19	1010.8	1017.7	77	58	67.4	+2.4	94	3	50	24	3	0	52.63	.07	-.56	.07	1	0	0	0	5.8	NW	19	SW	22	24	6	1	1.9	82				
San Francisco CO	52	-----	-----	69	54	61.6	+6.7	87	4	48	25	0	0	---	---	-.34	-.73	.20	5	0	0	0	7.5	---	25	W	1	20	5	6	3.0	81			
San Francisco	1	1016.3	1017.9	70	47	58.7	-7.7	88	4	40	25	0	0	48.72	.24	-.68	.17	4	0	0	0	9.9	NW	35	N	21	18	9	4	3.1	---	---			
Santa Maria	231	1007.1	1015.8	75	46	60.4	+4.4	95	3	38	24	3	0	43.62	.01	-.61	.01	1	0	0	0	7.6	E	*31	NE	2	23	6	2	2.1	---	---			
COLORADO																																			
Alamosa	7534	774.8	1022.0	63	25	43.9	-2.2	76	9	15	26	0	27	---	---	1.21	+1.63	.66	3	2	T	T	---	---	---	---	---	---	---	---	---	---	---	---	
Colorado Springs	6175	814.1	1019.6	65	39	51.7	+3.8	80	2	26	26	0	4	26.45	.74	+1.1	.31	7	1	1.9	1	10.2	NNW	*38	NNW	2	17	8	6	3.6	---	---			
Denver	5292	839.1	1017.2	68	41	54.4	+2.9	85	1	31	26	0	2	25.39	.44	-.57	.34	6	1	1	T	6.8	S	29	NW	21	12	11	8	4.4	74				
Grand Junction	4849	862.2	1018.1	68	42	54.9	+5.4	84	1	32	24	0	1	30.47	1.48	+1.64	.87	7	1	T	T	9.1	ESE	38	NW	19	17	7	8	3.8	80				
Pueblo	4799	859.5	1018.1	71	39	55.2	+2.5	87	1	30	26	0	4	33.48	.58	-.12	.32	5	0	0	0	5.6	NNW	46	N	3	18	9	4	3.4	72				
CONNECTICUT																																			
Bridgeport	7	1018.0	-----	67	47	57.1	+2.7	79	1	34	14	0	0	---	---	3.31	+4.8	1.52	6	1	0	0	---	---	---	---	---	---	---	---	---	---	---	---	
Hartford	15	1012.9	1018.6	67	43	54.9	+2.3	82	3	29	14	0	3	44.75	4.77	+2.07	1.30	9	0	0	0	5.8	NNE	26	NW	7	10	13	5.4	62					
New Haven	6	1014.2	-----	65	45	55.0	+1.7	77	3	32	14	0	2	---	---	3.61	+1.61	1.54	7	0	0	0	6.9	---	22	NW	7	10	12	4.9	65				
DELAWARE																																			
Wilmington	73	1015.6	1018.1	70	46	58.0	+1.8	80	18	34	8	0	0	48.75	3.87	+1.88	2.94	6	2	0	0	6.6	NNW	---	---	---	---	---	---	---	---	---	---		
FLORIDA																																			
Apalachicola	13	1015.6	1016.6	79	64	71.0	0	86	5	47	29	0	0	---	---	1.58	-.97	1.10	3	0	0	0	8.1	---	28	NE	3	20	10	1	2.6	75			
Daytona Beach	31	1014.6	1016.2	79	63	71.0	-2.4	87	6	45	30	0	0	63.81	12.93	+7.04	9.29	13	0	0	0	10.9	NE	*40	NNE	9	14	7	10	5.1	---	---			
Fort Myers	15	1014.6	1014.9	82	65	73.6	-2.7	88	6	49	31	0	0	66.81	6.68	+2.53	3.27	9	2	0	0	8.6	ENE	*45	SE	9	14	9	8	5.0	---	---			
Jacksonville CO	18	-----	-----	78	62	69.9	-1.4	86	6	45	30	0	0	---	---	5.32	+1.19	2.14	8	0	0	0	---	---	---	---	---	---	---	---	---	---	---		
Jacksonville	24	1016.6	1017.5	79	60	69.5	-1.4	86	6	43	30	0	0	60.77	5.43	-.72	2.27	7	0	0	0	9.8	NE	44	NE	3	11	10	5.1	57					
Key West	9	1013.2	1013.9	84	72	77.9	-1.6	89	1	62	31	0	0	70.79	8.22	+1.44	3.07	13	4	0	0	---	---	---	---	---	---	---	---	---	---	---	---	---	
Lakeland CO	214	-----	-----	80	65	72.2	-2.1	86	6	50	30	0	0	---	---	3.97	+1.44	.93	10	0	0	0	---	---	---	---	---	---	---	---	---	---	---	---	
Melbourne	26	-----	-----	80	66	73.0	-2.1	88	6	49	30	0	0	---	---	10.72	+4.34	3.59	17	2	0	0	---	---	---	---	---	---	---	---	---	---	---	---	
Miami CO	8	-----	-----	81	69	74.7	-2.9	87	6	57	30	0	0	---	---	12.93	+5.05	3.68	18	1	0	0	12.4	---	48	SW	9	7	13	11	5.8	51			
Miami	8	1012.9	1013.3	83	69	76.0	-1.9	88	5	56	30	0	0	68.80	10.26	+2.03	3.63	16	2	0	0	9.3	N	*45											

## CLIMATOLOGICAL DATA

Table 2—Continued

OCTOBER 1953

State and station	Elevation (ground)	Pressure			Temperature										Precipitation					Wind					No of days								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max 90° F or above Min 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days 0.1 inch or more With thunderstorms	Snow, Sleet, Hail	Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine			
ft	mb	mb	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	in	in	in	in	in	M	M	M	M	M	M	0-4	4-8	8-10	0-10	%					
IOWA																																	
Burlington	694	994.2	1020.1	72	46	58.8	+3.8	93	2	28	29	1	1	42	60	1.44	-1.51	0.98	3	1	T	T	9.1	SSW	63	W	3	14	8	9	4.3	82	
Des Moines	948	988.5	1019.8	72	46	58.9	+4.4	92	2	25	27	1	3	41	55	.13	-2.07	.07	4	2	.0	0	11.5	S	33	N	6	12	12	7	4.5	75	
Dubuque	1065	981.0	1020.4	69	44	56.5	+5.8	89	2	24	29	0	3	41	59	.32	-1.88	.18	5	2	.0	0	---	---	---	---	---	---	---	---	---	---	---
Sioux City	1093	977.0	1018.7	72	43	57.2	+4.8	93	2	29	28	1	3	42	63	1.35	-.69	.64	5	2	T	T	8.4	ESE	36	SW	2	17	8	6	3.3	81	
KANSAS																																	
Concordia CO	1375	968.5	-----	74	48	61.3	+3.6	91	10	30	27	2	1	42	56	.64	-1.08	.52	4	3	.0	0	7.5	---	26	SW	2	15	15	1	3.5	77	
Dodge City	2594	930.2	1018.1	73	49	60.7	+2.9	89	10	30	26	0	0	42	51	.89	-.68	.49	4	1	.0	0	15.0	S	47	NE	3	17	5	9	4.1	76	
Goodland	3645	900.6	1017.5	72	39	55.4	+3.3	98	2	24	4	1	8	35	53	.30	-.74	.13	5	2	T	0	12.4	SSE	*32	S	20	18	8	9	3.4	---	
Topeka	879	983.4	1019.4	76	47	61.3	+3.4	95	2	31	29	3	1	45	59	.99	-1.57	.53	5	1	.0	0	8.9	S	37	SE	21	11	13	7	4.3	72	
Wichita	1372	969.9	1018.5	74	52	62.6	+2.4	93	1	33	27	2	0	45	57	3.77	+1.59	1.76	5	3	T	T	13.3	S	43	S	2	13	6	12	5.1	69	
KENTUCKY																																	
Lexington	979	983.4	1019.3	75	48	61.8	+4.5	91	2	34	30	1	0	42	55	1.12	-1.32	.83	3	0	.0	0	9.0	NNE	---	---	---	19	7	5	3.3	---	
Louisville CO	457	-----	-----	75	52	63.5	+3.7	92	2	40	31	1	0	---	---	.77	-1.71	.46	3	---	.0	0	---	---	---	---	---	---	---	---	---	---	---
Louisville	474	1002.4	1018.8	76	45	60.4	+1.8	92	2	31	30	1	2	45	63	.80	-1.65	.54	3	0	.0	0	5.6	N	34	SW	11	20	6	5	3.0	80	
LOUISIANA																																	
Baton Rouge	64	1014.6	1017.6	83	55	69.1	-.5	91	18	36	30	1	0	55	67	.43	-2.55	.41	2	1	.0	0	6.7	N	---	---	---	18	8	5	3.6	---	
Lake Charles	12	1016.6	1017.8	83	59	71.1	+1.8	92	5	45	30	7	0	57	70	2.66	-.78	2.59	2	2	.0	0	6.0	E	---	---	---	16	8	7	4.0	---	
New Orleans CO	9	1015.6	-----	80	65	72.9	-.1	86	5	51	30	0	0	---	---	.63	-3.03	.45	3	1	.0	0	6.3	---	---	---	---	---	---	---	---	---	---
New Orleans	3	1015.6	1017.6	81	80	70.4	-1.0	87	2	46	28	0	0	59	71	.51	-2.67	.33	3	1	.0	0	8.3	ENE	*35	S	26	20	5	6	3.5	---	
Shreveport	252	1009.1	1018.4	82	57	69.7	+1.9	95	1	41	30	7	0	54	62	1.57	-1.53	1.55	3	2	.0	0	6.9	ESE	---	---	---	17	5	9	4.0	92	
MAINE																																	
Caribou	624	994.2	1017.8	55	34	44.0	+1.9	75	4	24	11	0	16	36	78	1.71	-1.76	.44	8	0	3.5	3	9.8	WNW	*30	WSW	4	8	6	17	6.5	---	
Portland	61	1013.9	1017.8	62	38	49.9	+1.5	78	4	22	9	0	8	42	78	3.83	+8.5	1.35	12	0	.0	0	9.3	N	35	NE	25	13	8	10	5.1	64	
MARYLAND																																	
Baltimore CO	14	-----	-----	70	53	61.5	+2.2	81	20	40	8	0	0	---	---	2.75	-.62	2.10	4	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Baltimore	146	1014.2	1019.0	70	45	57.6	+1.1	81	20	33	8	0	0	46	70	2.83	-.52	2.03	5	2	.0	0	10.0	NW	34	NW	7	19	6	6	3.4	71	
Frederick	294	-----	-----	71	41	55.8	-1.0	80	20	30	8	0	2	---	---	1.12	-2.17	.50	6	---	.0	0	---	---	---	---	---	---	---	---	---	---	---
MASSACHUSETTS																																	
Blue Hill Obs.	636	994.4	-----	63	46	53.5	+2.4	78	3	33	13	0	0	---	---	6.26	+2.82	2.28	11	0	.0	0	13.9	NNE	37	NW	7	12	8	11	5.3	52	
Boston	15	1013.5	1017.8	64	48	56.2	+1.2	80	3	30	14	0	0	45	72	4.91	+2.12	1.88	12	0	.0	0	12.7	SW	37	NE	25	15	2	14	5.2	56	
Nantucket	43	1016.6	1017.2	61	49	55.1	+2.1	72	1	38	14	0	0	51	86	4.35	+7.5	1.30	10	2	.0	0	12.7	NNE	38	NW	7	12	5	14	5.6	54	
Pittsfield	1153	975.3	1018.0	62	37	49.2	+1.7	79	3	21	14	0	9	---	---	3.25	+3.32	.92	9	0	.0	0	---	---	---	---	---	---	---	---	---	---	---
MICHIGAN																																	
Alpena CO	587	997.3	-----	59	42	50.8	+2.9	77	3	31	29	0	2	---	---	1.01	-.97	.60	7	0	.0	0	8.8	---	29	NW	3	12	10	9	4.9	57	
Detroit	619	992.9	1019.6	68	45	56.8	+3.9	89	3	35	8	0	0	43	67	.63	-1.66	.22	5	2	.0	0	7.3	N	30	NW	23	18	5	8	4.0	70	
Escanaba CO	594	996.3	-----	59	43	50.9	+3.8	70	3	30	27	0	0	---	---	.58	-1.46	.31	4	1	.0	0	10.2	---	36	N	3	12	9	10	4.8	59	
Grand Rapids	681	994.2	1019.7	68	41	54.5	+4.2	85	3	28	29	0	3	43	71	1.83	-.68	1.10	8	2	.0	0	7.5	ESE	35	NE	27	17	8	6	3.8	73	
Lansing	859	987.8	1020.2	67	42	54.2	+3.7	89	3	30	7	0	4	41	69	1.43	-1.02	.90	8	2	.0	0	8.5	SSW	33	W	23	18	4	9	3.8	69	
Marquette CO	677	991.5	-----	62	45	53.1	+5.6	83	21	34	24	0	0	---	---	1.69	-.57	.66	5	1	T	T	9.1	---	35	SW	13	10	10	11	5.6	62	
Muskegon	622	996.6	1020.0	65	42	53.8	+3.5	83	2	29	7	0	2	43	70	1.39	-1.13	.45	8	1	.0	0	---	---	---	---	---	---	---	---	---	---	---
Sault Ste Marie	721	997.0	1020.0	60	38	49.1	+4.7	78	2	27	7	0	7	42	81	.46	-2.52	.22	7	0	.0	0	8.0	E	26	SW	18	14	10	7	4.5	66	
Ypsilanti	722	990.9	1019.4	70	44	56.8	+4.3	89	3	31	8	0	1	41	65	.50	-1.67	.27	5	1	.0	0	8.3	SW	*26	W	3	17	7	7	4.0		
MINNESOTA																																	
Duluth	1409	976.6	1018.2	62	39	50.4	+6.4	86	2	24	8	0	7	41	75	.35	-1.87	.16	7	0	T	T	11.1	ESE	32	NW	3	13	9	9	4.8	70	
Intern'l Falls	1179	973.2	1017.5	61	36	48.9	+7.0	86	2	23	24	0	16	39	71	.59	-1.22	.25	7	0	T	0	8.8	---	---	---	---	---	---	---	---	---	---
Minneapolis	830	985.1	1018.8	69	46	57.4	+7.0	89	2	30	28	0	1	41	59	.15	-1.50	.08	3	0	.0	0	10.6	SSE	37	NW	5	18	10	3	3.0	80	
Rochester	1017	981.7	1019.1	68	40	54.4	+5.3	90	2	18	27	1	10	39	61	.20	-1.49	.19	2	1	.0	0	10.2	S	---	---	---	17	8	6	3.8	---	
St. Cloud	1034	979.7	1017.8	68	40	53.7	+7.1	90	2	27	28	1	7	41	68	.51	-1.13	.40	4	0	.0	0	7.3	S	---	---	---	17	9	5	3.5	---	
MISSISSIPPI																																	
Jackson	315	1006.4	1018.2	82	54	68.0	+1.6	94	1	35	30	7	0	50	59	.77	-1.41	.71	2	0	.0	0	5.5	SE	27	N	*6	21	3	7	3.3	78	
Meridian	294	1004.7	-----	82	50	65.8	+1.1	91	14	29	30	5	1	---	---	.08	-2.30	.08	1	1	.0	0	---	---	---	---	---	---	---	---	---	---	---
Vicksburg CO	234	1009.1	-----	80	59	69.2	+1.5	91	2	41	30	1	0	---	---	.42	-1.80	.39	2	0	.0	0	7.4	---	20	NW	28	17	7	7	3.6	75	
MISSOURI																																	
Columbia	778	990.9	1019.4	74	49	61.1	+3.0	92	2	32	29	2	1	44	60	2.31	-.90	1.56	6	1	.0	0	8.5	SSE	25	SE	*3	17	5	9	3.9	73	
Kansas City	741	984.4	1019.4	75	52	63.4	+3.8	93	2	36	29	2	0	45	55	1.64	-1.29	1.11	6	1	.0	0	8.3	S	27	NW	*3	17	7	7	4.0	78	
St. Joseph	809	984.1	1019.1	75	46	60.5	+2.4	94	2	28	29	1	2	42	53	.55	-1.98	.38	6	1	.0	0	8.8	---	30	SW	18	17	8	6	3.8	76	
St. Louis CO	465	999.3	-----	74	54	63.7	+3.1	92	2	39	29	1	0	---	---	2.89	-.01	2.06	4	0	.0	0	9.1	---	26	SW	3	20	5	6	3.3	83	
St. Louis	552	999.3	1019.7	74	50	62.0	+2.6	94	2	33	29	1	0	44	59	2.50	-.58	1.22	4	0	.0	0	6.5	S	---	---	---	18	7	6	3.6	---	
Springfield	1265	971.9	1019.3	73	50	61.7	+3.3	92	1	35	29	1	0	46	62	2.51	-.89	1.22	7	2	.0	0	10.7	SSE	31	SW	3	18	5	8	3.9	69	
MONTANA																																	
Billings	3568	893.0	1017.0	68	41	54.7</																											



## CLIMATOLOGICAL DATA

Table 2-Continued

OCTOBER 1953

State and station	Pressure						Temperature						Precipitation						Wind				No. of days									
	Elevation (ground)	Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days	No. 90° F or above	Min. 32° F or below	Average dew point	Average relative humidity	Precipitation						Wind		No. of days							
																	No. of days			No. of days			Snow, Sleet, Hail			Average hourly speed	Prevailing direction	Fastest mile	to sunset			
																	Total	1/4 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction				Clear	Partly cloudy	Cloudy	Sky cover (tenths (sunrise to sunset))
Ft	Mb	Mb.	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	In	In.	In.	0.1 inch or more	With thunderstorms	In.	In.	M	M.	M	0-4	4-7	7-10	%					
NEW JERSEY (Cont.)																																
Newark	11	1017.3	1018.3	69	49	58.8	+3.2	80	4	37	14	0	0	46	69	3.50	+0.30	2.10	6	2	0.0	0	8.4	NNE	*38	NW	7	17	6	8	4.3	
Trenton CO	56	1011.2	1018.0	69	48	58.4	+2.3	79	18	36	8	0	0	--	--	4.03	+1.38	2.06	7	1	0.0	0	7.1	---	*33	NW	7	17	5	9	4.0	
NEW MEXICO																																
Albuquerque	5310	850.7	1015.4	73	46	59.2	+1.0	84	2	37	25	0	0	31	40	.46	-.18	.40	4	3	0.0	0	8.4	SE	47	E	22	21	8	2	2.3	
Clayton	4969	850.7	1017.6	62	42	55.6	-.5	85	10	31	25	0	1	--	--	.45	-.85	.16	5	3	T	T	---	---	---	---	---	19	4	8	3.4	
Roswell	3612	895.4	1016.6	77	43	59.9	+1.0	91	10	31	27	2	1	34	44	.30	-.68	1.19	5	3	0.0	0	9.3	---	42	W	20	20	3	8	3.1	
NEW YORK																																
Albany	277	1014.9	1018.5	65	40	52.3	+1.6	81	3	24	14	0	5	42	74	3.54	+1.33	1.25	10	0	0.0	0	7.2	N	36	N	29	13	6	12	5.0	
Binghamton	1601	959.7	1019.0	62	41	51.6	+3.3	78	3	29	8	0	4	49	68	2.97	-.07	1.71	9	1	0.0	0	9.1	NW	31	W	7	15	5	11	4.6	
Buffalo	693	992.2	1019.8	65	44	54.3	+3.1	84	3	33	8	0	0	43	70	.32	-2.17	1.11	6	0	0.0	0	10.5	S	32	SW	19	15	8	8	4.4	
New York CO	10	1006.1	1017.0	68	52	60.0	+3.0	79	1	39	8	0	0	0	0	--	3.92	+8.88	2.07	6	2	0.0	0	10.1	---	45	NW	7	17	3	11	4.2
New York	19	1016.6	1018.4	66	53	60.7	+3.1	80	3	41	8	0	0	0	0	--	5.25	+2.84	2.94	8	1	0.0	0	10.0	NNE	49	NW	7	15	6	10	4.2
Rochester	543	1000.3	1019.7	65	42	53.0	+2.2	86	3	32	14	0	0	43	78	1.46	-.04	1.10	6	1	0.0	0	7.5	SW	25	N	6	13	9	4	6.3	
Schenectady	217	---	---	65	43	53.7	+3.4	80	3	32	9	0	1	--	--	3.21	+5.55	1.16	11	0	0.0	0	---	---	---	---	---	18	6	7	4.2	
Syracuse	424	998.0	1019.9	65	43	53.0	+3.6	84	3	28	14	0	2	42	73	1.64	-1.40	.80	6	0	0.0	0	5.9	NW	28	N	6	16	5	10	4.5	
NORTH CAROLINA																																
Asheville CO	2203	---	---	71	45	58.3	+1.3	84	1	32	31	0	1	--	--	.46	-2.08	---	4	1	0.0	0	6.6	---	24	NW	24	21	6	4	2.8	
Asheville	2093	945.8	1019.8	71	45	58.3	+1.3	84	1	32	31	0	1	--	--	.46	-2.08	---	4	1	0.0	0	6.6	---	24	NW	24	21	6	4	2.8	
Greensboro	891	987.5	1019.4	75	48	61.1	+2.1	85	16	37	9	0	0	48	69	.27	-2.33	1.20	2	2	0.0	0	6.2	NE	24	SE	18	21	6	4	3.2	
Hatteras	4	1016.6	1017.0	72	62	66.9	+6.1	81	1	53	30	0	0	60	80	2.86	-1.19	1.81	9	2	0.0	0	11.5	NNE	50	NW	22	13	5	10	5.8	
Raleigh CO	400	---	---	76	52	63.7	+1.1	87	1	43	9	0	0	0	0	--	.59	-2.09	.37	3	1	0.0	0	4.9	---	16	NW	29	18	4	9	3.8
Raleigh	438	1002.7	1018.5	75	49	61.9	+8.7	81	1	36	9	0	0	50	73	.44	-2.38	.29	2	1	0.0	0	5.5	NE	---	---	---	18	6	7	3.4	
Wilmington	30	1016.3	1017.7	76	55	65.5	+2.8	85	20	41	31	0	0	0	0	--	.17	-2.61	.13	3	0	0.0	0	8.6	---	35	NE	22	17	5	9	4.5
Winston-Salem	967	983.4	1018.5	75	51	62.6	+2.5	85	20	38	8	0	0	46	59	.29	-2.84	.23	2	2	0.0	0	7.4	NE	*22	NE	13	22	5	4	2.6	
NORTH DAKOTA																																
Bismarck	1650	955.3	1016.1	67	37	52.1	+6.4	95	1	20	6	1	9	38	64	1.03	+0.03	.45	5	1	0.0	0	9.2	SSE	38	NW	22	14	7	10	4.7	
Devils Lake CO	1471	962.4	1016.6	64	39	51.5	+7.6	88	1	21	6	0	8	--	--	.59	-.67	.22	4	1	0.0	0	8.0	---	28	N	5	13	11	7	4.6	
Fargo	895	982.7	1016.7	66	41	53.5	+7.4	90	1	24	6	1	7	39	63	.32	-.94	.25	5	1	T	T	13.9	SSE	35	SE	21	10	11	10	5.1	
Williston CO	1877	947.5	1015.6	66	38	52.3	+6.8	91	1	27	26	1	3	36	60	1.67	+0.90	1.47	2	0	T	T	5.7	---	24	W	1	14	8	9	4.5	
OHIO																																
Akron	1210	968.5	1020.1	68	42	55.0	+2.0	85	3	31	30	0	2	41	67	.45	-1.94	.13	8	0	0.0	0	6.3	N	---	---	---	18	6	7	3.7	
Cincinnati Obs.	761	---	---	74	46	60.0	+2.6	90	2	35	31	1	0	--	--	1.17	-1.02	.73	6	1	0.0	0	5.0	---	17	N	4	---	---	---	7.7	
Cincinnati	869	987.5	1019.5	73	46	59.2	+3.2	89	2	28	30	0	1	40	56	1.24	-.93	.76	5	1	0.0	0	7.1	NE	---	---	---	19	4	8	3.8	
Cleveland CO	663	---	---	67	49	58.4	+2.9	91	3	37	8	1	0	--	--	1.07	-1.30	.62	4	---	---	---	---	---	---	---	---	---	---	---	---	---
Cleveland	787	991.9	1019.4	70	45	57.4	+3.0	89	3	32	8	0	1	43	46	1.28	-1.14	.68	7	1	T	T	7.9	S	28	W	23	19	4	8	4.1	
Columbus CO	724	---	---	73	49	61.0	+4.9	89	3	38	7	0	0	0	0	--	.58	-1.42	.39	4	---	---	---	---	---	---	---	---	---	---	---	---
Columbus	815	989.2	1019.5	72	43	57.2	+2.7	89	2	27	30	0	2	42	62	1.38	-1.53	.34	5	0	0.0	0	7.2	N	---	---	---	6	21	2	8	3.3
Dayton	1002	983.4	1019.8	71	46	58.8	+3.7	89	3	34	30	0	0	41	59	.62	-1.68	.30	4	0	0.0	0	7.2	N	32	NW	6	18	6	7	3.7	
Portsmouth Area CO	715	---	---	74	42	57.9	+1.9	87	4	27	8	0	4	--	--	.68	-1.60	.49	4	0	0.0	0	3.7	---	34	W	27	---	---	---	---	
Sandusky	603	997.3	---	68	48	58.1	+3.1	93	3	35	30	1	0	--	--	.77	-1.33	.23	5	1	T	T	5.5	---	28	NW	23	18	5	8	3.9	
Toledo	622	996.6	1019.9	69	43	56.1	+3.4	90	3	31	30	1	1	43	70	.78	-1.54	.45	5	1	0.0	0	8.0	SW	29	NW	23	15	10	6	4.0	
Youngstown	1178	977.3	1019.9	67	42	54.1	+2.2	84	3	27	8	0	1	40	67	.43	-2.34	.18	7	1	0.0	0	7.9	NE	*23	NNW	7	18	5	8	3.6	
OKLAHOMA																																
Oklahoma City	1280	971.9	1018.6	74	53	63.7	+1.5	94	1	37	27	3	0	51	69	5.75	+3.09	2.10	7	5	0.0	0	12.4	SSE	36	N	26	14	6	11	4.7	
Tulsa	672	993.9	1017.0	77	52	64.9	+1.5	96	1	36	27	3	0	50	64	3.46	+3.37	1.65	7	2	0.0	0	9.5	S	34	NW	3	14	8	9	4.7	
OREGON																																
Astoria	12	1018.6	1019.6	63	46	54.2	+1.1	78	5	35	22	0	0	50	85	4.30	-1.86	1.14	16	1	T	T	5.3	SE	---	---	---	10	8	13	6.1	
Burns CO	4140	876.1	1019.8	66	32	48.7	+1.5	82	7	22	24	0	19	28	51	.42	-.38	.24	4	0	T	T	5.5	SSE	---	---	---	14	6	11	4.7	
Eugene	646	1007.8	1019.7	66	42	53.8	+1.1	82	5	31	23	0	1	47	80	3.05	-1.52	1.14	8	1	T	T	5.5	SSE	---	---	---	10	8	11	6.1	
Medford	4050	---	---	59	39	49.0	+3.5	79	1	29	22	0	0	0	0	--	1.38	-1.86	.87	0	0	0.0	0	---	---	---	---	---	---	---	---	---
Medford	1312	972.2	1020.1	67	38	52.5	+2.0	84	4	28	22	0	4	43	58	1.42	-.49	.84	5	0	0.0	0	1.3	S	*14	NNW	1	9	10	12	5.4	
Pendleton	1489	965.5	1019.4	65	43	53.8	+2.8	80	7	31	22	0	1	37	56	.71	-.47	.50	5	0	0.0	0	6.9	SE	---	---	---	15	4	12	6.0	
Portland	22	1013.9	1019.4	64	44	54.3	-.4	77	5	33	21	0	0	49	84	3.56	+3.39	1.63	9	2	0.0	0	4.9	SE	30	SW	1	8	9	14	4.9	
Roseburg	505	1001.0	1019.6	66	41	53.9	---	86	5	31	21	0	4	--	--	2.96	+0.3	1.27	7	0	0.0	0	3.1	---	20	NW	10	4	15	12	6.2	
Salem	195	1011.9	1019.5	66	42	54.2	-.3	80	4	33	21	0	0	47	80	3.06	-.64	1.46	8	1	0.0	0	5.8	S	---	---	---	10	9	12	5.7	
Sexton Summit CO	3836	---	---	58	44	51.0	+1.7	75	6	32	21	0	1	--	--	3.12	-.72	1.47	6	0	T	T	---	---	---	---	---	15	5	11	4.5	
PENNSYLVANIA																																
Allentown	376	1004.7	1018.8	69	42	55.3	+2.1	80	18	29	14	0	3	44	73	3.23	+2.6	1.99	5	1	0.0	0	6.1	W	---	---	---	17	5	9	3.8	
Harrisburg	335	1005.4	1019.1	70	45	57.2	+2.0	80	2																							

See footnotes at end of table.

## CLIMATOLOGICAL DATA

Table 2—Continued

OCTOBER 1953

State and station	Elevation (ground) Station	Pressure			Temperature										Precipitation					Wind			No. of days																																								
		Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max 90° F or above Min 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	0.1 inch or more	With thunderstorms	Total	Snow, Sleet, Hail	Max depth on ground	Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine																																
Fi	Mb	Mb.	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	In.	In.	In.	In.	In.	In.	In.	p. h	M	M	h	h	h	h	h	h	h	%																																
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											
																																		0	4	8	0	10	%																								
																																		3	7	10																											



## (Base 65°F.)

OCTOBER 1953

Data from airport unless otherwise specified CO indicates data from city office.

# SEVERE STORMS

Table 4

OCTOBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Aroostook County, Me.	7-8	A. m., 7th- a. m., 8th					\$3,500		Snow	Unusually early-season snowstorm with up to 5 inches in northeastern part of County. Heavy, wet snow damaged telephone and power lines and broke limbs from trees. Plowing required in some districts.
St. James City (near Ft. Myers), Fla.	9	9-10 a. m.	25	5	0	0	3,000	\$0	Tornado	Associated with tropical storm listed below; moved northwestward.
Florida, southern portion	9	11:30 a. m.- 5 p. m.	*100	150			9,250,000		Tropical storm	Storm originated in Yucatan Channel on 8th and moved into Florida via Charlotte Harbor between Fort Myers and Punta Gorda, 11:30 a. m., 9th, with winds slightly below hurricane force. Storm moved rapidly north-eastward and entered Atlantic near Vero Beach about 5 p. m. One or more small tornadoes associated with this storm. Total wind damage estimated \$250,000, and \$96,000 of this occurred in Fort Myers-Sarasota area. Rainfall not very heavy to south of storm center, but amounted to 3 to 5 inches near center and to north, augmenting an already serious flood condition. Impossible to say how much storm rains added to flood damage, but over-all flood damage estimated at \$9,000,000. Flood damage partly property and partly crops, with major portion of property damage suffered by roadways, streets, and drainage systems.
Yakutat (coastal waters from Cape Spen- cer to Yakutat), Alaska	11								Wind	Navy barge broke loose from her tow tug about 40 to 50 miles north-northwest of Cape Spencer between 0500 and 0600 LST and was blown some 70 miles north-westward before going aground on sand beach 8 miles from Yakutat Airport. Winds up to 80 knots reported from the tug. Barge was adrift for about 9 hours. No damage, but cost of floating barge again will be considerable. 3 ships and many Navy and Coast Guard personnel have been tied up for more than 6 weeks awaiting proper tide and weather conditions to float barge.
Coats (2½ miles west of), Pratt County, Kans.	14	8:30 p. m.	Nar- row		0	0			Wind (pos- sible tornado)	Locally severe wind with tornadic characteristics destroyed 100-foot long cattle shed, carrying sheet metal roof over tree tops and damaging power lines 100 yards north.
Westmore- land, Pot- tawatomie County, Kans.	17								Electri- cal	Barn burned.
Ordway (20 miles north of), Colo.	20	10:30- 10:45 a. m.	200	2	0	0	4,000	0	Tornado, hail, and rain	A moderate tornado or twister, accompanied by rain and hail, uprooted trees, smashed buildings, and damaged transmission lines. Hailstones ranged in size from peas to pigeon eggs and completely covered ground.
Fowler, Colo.	20	10:45- 10:55 a. m.	880	10	0	0	15,000	0	Tornado	A "whirlpool" type tornado. No funnel cloud observed. Damage mostly to buildings, trees, and transmission lines.
Amarillo, Tex.	20					5	*28,000		Wind	In northeastern part of city.
Buffalo (near), Harper County, Okla.	21	1:45 a. m.	100	1/4			1,500		do	Damage to airplane, hangar, and machine shed. Storm lasted about 20 minutes.
Juneau, Alaska	21-22	5 p. m., 21st- 5 p. m., 22d					200,000		Rain	Measurable rain on all but 2 days of month with 2.33 inches for 24-hour period ending October 21 and 4.43 inches for 24-hour period ending 5 p. m. October 22 in city of Juneau caused flooding of Gold Creek and slides along mountainsides in a few places in town and along highway. Damage to streets and cost of clearing logs and other debris estimated at \$200,000 in Juneau and on highways adjacent to city.
Sonnette, Powder River Coun- ty, Mont.	21-22						20,000		Wind and snow	REA power poles blown over.
Big Horn Mountains, Wyo.	21-23	Evening 21st- early morning 23d							Snow	First heavy snow of season blocked woods and trapped estimated 300 hunters, some as much as 5 days.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

OCTOBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
West side of Stanislaus County (lower portion of San Joaquin Valley), Calif.	21							\$300,000	Wind	Lima bean crop suffered an estimated \$300,000 damage 28,000 sacks, or about one-fourth of the crop lost.
Utah, northern portion	22-23	Early a.m., 22d—p.m., 23d					\$100,000		Winds and snow	Damage primarily to 2 large buildings, a school, and a church, which were under construction in Ogden; also, radio transmitting tower demolished, power and telephone services disrupted, trees and signs toppled, windows broken, etc. Several minor automobile accidents and one major one involving serious injuries, attributed to storm. Personnel at Hill Field abandoned tower at 4:05 p.m. on 22d when gusts reached 85 m.p.h.; also, gusts up to 70 m.p.h. at Ogden Airport and over 55 m.p.h. at University of Utah.
Loving Eddy County, N. Mex.	22	6:30 p.m.						1,000	Hail and rain	Damage confined to cotton in fields.
Austin (near), Tex.	23	2 a.m.	100	½	0	0	15,000	0	Tornado	3.7 miles west of city limits near Oak Hill.
Southern sea coast and Delaware Bay areas, N.J.	23	P.m.					15,000	0	Wind and tides	Wind-driven tides covered shore area, streets, and grounds. Considerable sand deposited.
Caliente, Nev.	23				1				Snow	Man killed by falling limb from tree, due to heavy snow.
Port Washington, Wis.	24	Early a.m.			4				Wind	4 men drowned when sudden easterly wind swept them off breakwater into Lake Michigan.
Lake Charles, Calcasieu Parish, La.	25	3:30 a.m.			0	0	4,000	0	Tornado	Several buildings destroyed and several others damaged southwest of Lake Charles.
New England Coast (Cape Cod northward)	25	All day					Heavy		Wind, surf, and rain	Northeast gales, rain, and heavy surf lashed New England Coast, particularly area between Provincetown, Mass., and Portland, Me. A number of small communities along immediate coast temporarily isolated and without electric power, as tremendous waves crashed high over seawalls flooding roads and cellars. Considerable damage to foundations of summer homes, and highest tide in years reported from several localities.
Houston (near), Tex.	26	2:45 a.m.	*1½	2			2,000,000		Wind	Aircraft broke loose from moorings and piled up with damage of \$1,500,000. 4 homes destroyed, 6 others damaged near Municipal Airport. Gusts up to 80 m.p.h. recorded at Airport. Many roofs in various parts of city damaged.
Beaumont-Port Arthur-Orange, Tex.	26	4:30 a.m.					10,000		do	Most of damage in Port Arthur. Gusts of 55 m.p.h. recorded at Airport. Antennae and signs damaged. 1 small structure in Port Arthur destroyed.
Galveston, Tex.	26						10,000		do	Gusts up to 84 m.p.h. 2 ships blown loose from moorings in Galveston Harbor. Damage to ball park fence, signboards, trees, and TV antennae.
Victoria, Victoria County, Tex.	26								do	Structural damage to buildings, trees, and TV antennae.
Florence, Pa.	27	Evening					Several thousand		Electrical	Grain and hay storehouse and contents burned.
Newville, Pa.	28	Early morning					Several thousand		do	Barn burned, and telephone lines knocked out; machinery and harvested crops lost.
Concord, Campbell County, Va.	28-29								Rains	New wheat badly washed in Spring Mill district.
Whatcom, Skagit and Snohomish Counties, Wash.	30-31								do	Continued heavy precipitation on western slope of Cascades resulted in several rivers overflowing. 1 highway bridge damaged by floating logs. Only minor crop and other property losses.
Victoria (near), Victoria County, Tex.	31	8:30 a.m.			0	0	0	0	Tornado	Unconfirmed tornado 4 miles southwest of Airport; did not touch ground.

\* Miles instead of yards.

° Crop damage included with other property damage.

# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

OCTOBER 1953

Streams throughout the Country remained at generally low levels with only minor local flooding reported in the East Gulf of Mexico Drainage and in the Pacific Northwest. Record-low stages were reached at scattered points.

**ATLANTIC SLOPE.**--The streams along the Atlantic Coast continued at very low stages throughout the month. The Susquehanna River at Wilkes-Barre, Pa., which reached a record-low stage during September, repeated the same stage during October. The South Branch of the Potomac at Springfield, W. Va., reached a new record-low stage of 2.55 feet on the 2d and on other dates throughout the month.

**EAST GULF OF MEXICO.**--Heavy rains during the latter part of September resulted in moderate to strong rises on the Flint, Apalachicola, Choctawhatchee, and lower Chattahoochee Rivers during the last few days of September, and the first few days of October. The Apalachicola at Blountstown, Fla., and the Choctawhatchee at Caryville, Fla., were in minor flood during the latter part of September and the first few days of October.

**Missouri Basin.**--Streams in the Missouri Basin continued at low stages throughout the month with the Marais des Cygnes at Ottawa, Kans., reaching a low stage of 0.5 foot from the 21st to the 25th, the lowest stage since daily observations began in 1948.

**Ohio Basin.**--All uncontrolled streams in the Ohio Basin between Dam No. 23 and Dam No. 30 are near the record-low stages--the lowest since 1930.

The lowest stage of record, 1.42 feet, was registered at Circleville, Ohio, on the Scioto River on October 4. The previous low stage was

1.45 feet.

**Arkansas Basin.**--Streams in the Arkansas Basin were below normal most of the month. The average monthly stage of the Cimarron River at Perkins, Okla., was 3.9 feet, or 0.9 foot below normal. However, it was 1.3 feet higher than the average for October 1952. On the Arkansas River the average monthly river stage at Tulsa, Okla., was 2.8 feet, or 2.1 feet below normal. This was the lowest October average stage of record. Octobers of 1939 and 1947 averaged 2.9 feet. At Van Buren, Ark., the average monthly stage was 3.0 feet, or 4.0 feet below normal.

**LOWER MISSISSIPPI.**--The Mississippi River reached a low stage of -3.6 feet at Vicksburg, Miss., on the 31st, the lowest stage for October since 1940. At Memphis, Tenn., the Mississippi reached a record-low stage of -3.3 feet on the 17th, and again on the 26th. The previous low stage at this point was -2.7 feet on November 9, 1895.

**WEST GULF OF MEXICO.**--All streams remained low throughout the month. The level of the Sabine River at Logansport, La., was below the zero of the gage throughout the month. On the Calcasieu River at Oakdale, the river rose above the zero for only one day.

**PACIFIC SLOPE DRAINAGE.**--The Snohomish River at Snohomish, Wash., and the Snoqualmie River at Carnation, Wash., exceeded flood stage on October 31 and November 1. The Nooksack, Skagit, and Stillaquamish Rivers approached to within 1 or 2 feet of flood stage. the only damage was from driftwood to a bridge under construction at Mt. Vernon, Wash.

## FLOOD STAGE DATA

(All dates in October unless otherwise specified)

Table 5

OCTOBER 1953

River and station	Flood stage	Above flood stages -dates		Crest*	
		From-	To-	Stage	Date
EAST GULF OF MEXICO DRAINAGE					
Apalachicola: Blountstown, Fla.	15	Sept. 30	5	16.2	1
Choctawhatchee: Caryville, Fla.	12	Sept. 29	3	*13.4	Sept. 30
PACIFIC SLOPE DRAINAGE					
<u>Miscellaneous Basins</u>					
Snohomish: Snohomish, Wash.	23.6	31	Nov. 1	24.9	31
Snoqualmie: Carnation, 1 NW, Wash.	51.5	31	Nov. 1	53.2	Nov. 1

\* Provisional  
° From hydrograph



# RADIOSONDE DATA

Average monthly values

OCTOBER 1953

Table 20

ALBUQUERQUE, N. MEX. ( 840 MB.)					ATLANTA, GA. ( 983 MB.)					BIG SPRING, TEX. ( 928 MB.)					BISMARCK, N. DAK. ( 956 MB.)					BOISE, IDAHO ( 917 MB.)					BROWNSVILLE, TEX. (1016 MB.)					BUFFALO, N. Y. ( 993 MB.)				
Standard pressure surface (mb.)	Number of observations				Dynamic height	Temperature	Relative humidity	Number of observations				Dynamic height	Temperature	Relative humidity	Number of observations				Dynamic height	Temperature	Relative humidity	Number of observations				Dynamic height	Temperature	Relative humidity						
SURFACE	31	1,619	15.4	35	31	309	16.1	73	31	784	18.9	56	31	505	10.0	64	31	868	11.3	52	31	7	23.0	77	31	221	10.4	78						
1,000---	31	101			31	164			31	131			31	123			31	137			31	143	23.5	71	31	164	11.1							
950---	31	550			31	610	18.1	56	31	579			31	559	11.7	55	31	576			31	590	20.7	66	31	599	12.4	57						
900---	31	1,022			31	1,065	14.9	55	31	1,046	18.9	51	31	1,011	13.2	47	31	1,029	14.6	40	31	1,056	18.0	61	31	1,047	9.6	55						
850---	31	1,515			31	1,546	11.8	54	31	1,535	16.0	53	31	1,489	10.7	46	31	1,511	13.0	37	31	1,544	15.5	52	31	1,519	7.3	48						
800---	31	2,051	14.8	31	31	2,051	9.1	48	31	2,048	13.1	48	31	1,992	7.8	44	31	2,018	9.4	41	31	2,056	13.2	45	31	2,016	5.1	43						
750---	31	2,576	10.7	34	31	2,591	6.5	42	31	2,592	10.0	44	31	2,528	4.9	41	31	2,555	5.6	43	31	2,602	10.6	42	31	2,546	2.5	41						
700---	31	3,143	6.1	39	31	3,147	3.4	31	31	3,158	6.3	42	31	3,081	1.7	37	31	3,109	1.7	46	31	3,168	7.5	42	31	3,095	- 5	41						
650---	31	3,749	1.1	44	31	3,748			31	3,768	2.5	37	31	3,680	- 1.7	34	31	3,712	- 2.4	46	29	3,782	4.3	39	31	3,690	- 3.4	35						
600---	31	4,383	- 3.9	46	31	4,381	- 3.7		31	4,403	- 1.7	33	31	4,306	- 5.8	33	31	4,333	- 6.4	40	29	4,424		36	31	4,312	- 7.2							
550---	31	5,061	- 9.0	42	31	5,070	- 7.6		31	5,091	- 6.2		31	4,989	-10.0	34	31	5,015	-10.5	38	27	5,117	- 3.3	37	31	4,989	-11.9							
500---	31	5,794	-13.7	31	31	5,803	-12.5		31	5,829	-11.2		31	5,707	-15.0		31	5,735	-15.5	39	26	5,866	- 8.0		31	5,708	-16.6							
450---	31	6,598	-19.3		27	6,614	-17.6		31	6,641	-17.0		31	6,502	-20.7		31	6,529	-21.2	40	25	6,686	-13.1		31	6,497	-22.4							
400---	31	7,452	-25.6		27	7,476	-24.1		31	7,503	-23.3		29	7,354	-27.4		31	7,381	-27.5	43	24	7,568	-18.8		31	7,346	-28.8							
350---	31	8,406	-32.7		26	8,435	-31.3		31	8,465	-30.7		29	8,299	-35.0		31	8,327	-34.5		24	8,548	-25.9		31	8,286	-35.9							
300---	31	9,473	-40.6		26	9,508	-39.2		31	9,541	-38.6		29	9,355	-43.2		31	9,386	-42.7		24	9,643	-34.5		31	9,333	-43.4							
250---	31	10,690	-48.9		31	10,734	-47.4		31	10,769	-46.4		29	10,559	-51.3		31	10,593	-50.1		24	10,888	-44.7		31	10,536	-51.1							
200---	31	12,133	-54.6		31	12,182	-55.0		31	12,225	-54.0		29	11,990	-56.0		31	12,030	-55.8		22	12,353	-55.6		31	11,969	-55.5							
175---	31	12,980	-57.7		31	13,028	-58.1		31	13,073	-58.0		29	12,837	-57.1		31	12,877	-57.1		22	13,192	-61.1		31	12,812	-59.7							
150---	31	13,944	-60.7		31	14,000	-61.4		31	14,034	-61.9		29	13,807	-59.0		31	13,849	-59.1		19	14,124	-67.3		31	13,773	-58.4							
125---	31	15,070	-63.5		31	15,112	-64.5		31	15,150	-65.4		28	14,947	-60.3		31	14,986	-60.8		17	15,207	-72.2		31	14,912	-59.4							
100---	31	16,434	-65.1		24	16,465	-66.1		31	16,502	-67.0		28	16,331	-60.3		31	16,371	-60.9		13	16,508	-73.6		31	16,308	-60.8							
80---	25	17,800	-65.0		23	17,818	-65.0		31	17,847	-66.8		28	17,722	-59.4		28	17,758	-60.6		9	17,820	-69.0		31	17,690	-59.9							
60---	21	19,555	-62.6		20	19,586	-60.8		31	19,603	-63.3		24	19,540	-58.0		31	19,560	-58.9		7	19,578	-60.5		31	19,496	-58.2							
50---	17	20,678	-60.4		18	20,732	-57.9		31	20,742	-61.6		20	20,698	-57.6		31	20,708	-58.2		5	20,714	-57.8		31	20,651	-56.9							
40---	12	22,083	-57.6		17	22,144	-55.4		31	22,124	-58.2		9	22,118	-56.2		31	22,125	-56.7		16	22,125	-56.7		31	22,072	-56.1							
30---					11	23,975	-51.9		31								31	23,966	-54.3						31	23,932	-53.9							

BURRWOOD, LA. (1017 MB.)					CARIBOU, ME. ( 994 MB.)					CHARLESTON, S. C. (1016 MB.)					COLUMBIA, MO. ( 991 MB.)					DODGE CITY, KANS. ( 928 MB.)					EL PASO, TEX. ( 883 MB.)					ELY, NEV. ( 811 MB.)				
Standard pressure surface (mb.)	Number of observations				Dynamic height	Temperature	Relative humidity	Number of observations				Dynamic height	Temperature	Relative humidity	Number of observations				Dynamic height	Temperature	Relative humidity	Number of observations				Dynamic height	Temperature	Relative humidity						
SURFACE	31	3	22.7	77	31	191	5.3	79	31	13	16.7	88	31	238	15.1	61	31	792	15.3	53	31	1,195	18.6	35	31	1,908	7.4	47						
1,000---	31	148	22.7	67	31	144	5.3		31	153	19.9	72	31	157			31	145			31	1,106			31	1,277								
950---	31	595	19.8	58	31	568	6.5	61	31	601	18.2	61	31	595	17.1	47	31	591			31	1,559			31	1,575								
900---	31	1,057	16.7	54	31	1,007	4.8	56	31	1,056	15.0	62	31	1,055	13.8	50	31	1,049	17.0	43	31	1,029	19.4	28	31	1,033								
850---	31	1,541	13.6	49	31	1,471	2.7	57	31	1,538	11.8	57	31	1,534	11.1	48	31	1,534	14.1	45	31	1,521	15.4	28	31	1,510								
800---	31	2,049	11.0	37	31	1,960	- 6	51	31	2,043	9.2	47	31	2,038	9.2	40	31	2,042	11.2	45	31	2,042	11.2	45	31	2,017	11.2	40						
750---	31	2,593	9.0		31	2,480	- 1.4	51	31	2,582	6.5	43	31	2,577	6.3	35	31	2,583	7.6	44	31	2,588	11.2	32	31	2,558	8.1	40						
700---	31	3,154	6.0		31	3,023	- 4.1	50	31	3,139	3.4	40	31	3,133	2.8	38	31	3,142	4.0	42	31	3,152	6.7	36	31	3,117	3.5	45						
650---	31	3,764	2.9		31	3,607	- 6.9	44	31	3,743	- 3.1	38	31	3,735	- 1.0	37	31	3,744	- 2.3	38	31	3,762	2.2	36	31	3,718	- 4.8	45						
600---	31	4,401	- 9		31	4,225	-10.1	38	31	4,373	- 3.4	30	31	4,363	- 4.9	35	31	4,377	- 4.2	37	31	4,396	- 2.3	35	31	4,349	- 4.8	41						
550---	31	5,091	- 5.5		31	4,895	-13.6	36	31	5,059	- 7.5		31	5,044	- 9.1	31	31	5,057	- 8.4		31	5,083	- 6.8		31	5,026	- 9.0							
500---	31	5,832	-10.3		31	5,608	-18.6	35	31	5,791	-12.2		31	5,773	-14.1		31	5,790	-13.3		31	5,818	-11.8		31	5,750	-12.5							
450---	29	6,641	-15.6		31	6,391	-24.2		31	6,597	-17.0		31	6,571	-19.8		31	6,590	-19.2		31	6,626	-17.3		31	6,553	-20.1							
400---	29	7,512	-21.9		31	7,234	-30.5	38	31	7,457	-24.6		31	7,428	-26.3		31	7,449	-25.8		31	7,489	-23.8		31	7,412	-26.8							
350---	29	8,479	-29.2		31	8,168	-37.9		31	8,416	-31.4		31	8,376	-34.0		31	8,401	-33.1		31	8,448	-31.0		31	8,361	-34.4							
300---	28	9,563	-37.2		31	9,211	-45.8		31	9,495	-38.9		31	9,436	-42.4		31	9,464	-41.5		31	9,521	-38.8		31	9,421	-41.8							
250---	26	10,794	-46.4		31	10,405	-52.5		31	10,723	-47.3		31	10,642	-51.1		31	10,676	-49.9		31	10,749	-46.6		31	10,635	-49.2							
200---	26	12,243	-56.0		31	11,827	-56.1		31	12,170	-55.9		31	12,066	-58.0																			

# RADIOSONDE DATA

Average monthly values

Table 20—Continued

OCTOBER 1953

Standard pressure surface (mb.)	INTERNAT. FALLS, MINN. ( 974 MB.)				LAKE CHARLES, LA. (1017 MB.)				LANDER, WYO. ( 831 MB.)				LAS VEGAS, NEV. ( 937 MB.)				LITTLE ROCK, ARK. (1009 MB.)				MAZATLAN, MEXICO (1008 MB.)				MEDFORD, ORE. ( 972 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	360	8.8	75	31	155	19.9	74	31	1,696	10.0	46	31	660	19.9	25	31	79	16.6	68	31	14	28.7	74	31	401	11.8	81
1,000----	31	138			31	155	22.3	59	31	1,222			31	91			31	155	20.6	50	31	89	28.0	74	31	157		
950----	31	567	11.7	59	31	600	19.9	54	31	568			31	544			31	599	19.7	42	31	546	25.5	67	31	594	14.3	64
900----	31	1,017	9.1	54	31	1,063	16.6	56	31	1,028			31	1,009	21.6	22	31	1,062	16.4	46	31	1,018	23.1	63	31	1,046	12.7	55
850----	31	1,488	6.7	50	31	1,547	13.6	55	31	1,508			31	1,500	17.6	24	31	1,545	13.2	47	31	1,515	20.3	58	31	1,523	9.8	53
800----	31	1,984	4.6	45	31	2,056	11.4	44	31	2,016	11.4	41	31	2,014	13.2	27	31	2,052	10.1	45	31	2,036	17.0	59	31	2,024	6.7	52
750----	31	2,510	2.1	41	31	2,600	8.9		31	2,558	7.8	43	31	2,558	8.5	31	31	2,594	7.2	40	31	2,589	13.3	59	31	2,557	3.7	50
700----	31	3,061	-1.0	42	31	3,160	5.7		31	3,117	3.8	46	31	3,117	3.9	34	31	3,151	4.1	34	31	3,161	9.5	61	31	3,108	1.0	42
650----	31	3,653	-4.3	41	31	3,769	2.3		31	3,719	-2.4	47	31	3,719	-0.3	34	31	3,755	-9.1	31	31	3,779	5.2	64	31	3,706	-2.1	37
600----	31	4,275	-8.3	42	31	4,405	-1.3		31	4,350	-4.3	45	31	4,351	-3.9	28	31	4,389	-2.7		31	4,422	-9.6	65	31	4,332	-5.8	37
550----	31	4,945	-12.6	42	31	5,095	-5.4		31	5,030	-8.7	40	30	5,031	-8.1		31	5,075	-7.1		31	5,115	-3.0	62	31	5,012	-10.0	35
500----	31	5,664	-17.5	42	30	5,835	-10.2		31	5,761	-13.8	34	30	5,764	-13.4		31	5,810	-11.7		30	5,866	-7.4	56	30	5,740	-14.6	
450----	31	6,447	-23.0	40	30	6,648	-15.9		31	6,560	-19.5		31	6,562	-19.5		31	6,619	-17.3		29	6,683	-12.3	49	30	6,538	-20.0	31
400----	31	7,297	-29.3	40	30	7,517	-22.1		31	7,417	-25.9	35	30	7,421	-26.2		31	7,481	-23.8		29	7,572	-18.0	30	31	7,393	-26.4	34
350----	31	8,236	-36.3	35	29	8,466	-29.2		29	8,367	-33.6	35	30	8,370	-33.7		31	8,441	-31.1		29	8,556	-24.9	30	31	8,344	-33.3	34
300----	31	9,286	-44.3		29	9,568	-37.2		29	9,436	-41.9		30	9,434	-40.7		31	9,514	-39.3		29	9,657	-33.2	30	31	9,410	-41.1	
250----	30	10,493	-52.1		29	10,800	-46.4		26	10,655	-50.1		30	10,652	-48.4		31	10,738	-47.6		27	10,910	-43.5	29	31	10,627	-50.2	
200----	29	11,921	-56.6		28	12,250	-55.1		26	12,093	-54.9		30	12,098	-53.7		31	12,186	-54.6		22	12,375	-55.3	29	31	12,059	-56.4	
175----	28	12,766	-57.3		28	13,094	-59.3		26	12,943	-56.2		29	12,960	-56.3		31	13,034	-57.7		16	13,219	-61.7	29	31	12,903	-57.8	
150----	27	13,743	-59.1		28	14,047	-63.6		24	13,909	-57.7		29	13,929	-59.7		31	13,999	-60.7		14	14,155	-68.3	29	31	13,869	-59.9	
125----	27	14,883	-60.1		28	15,155	-67.0		24	15,053	-59.7		29	15,059	-62.6		31	15,123	-63.8		6	15,221	-72.3	28	31	15,002	-61.5	
100----	26	16,271	-59.8		26	16,490	-68.8		23	16,441	-60.1		28	16,430	-63.6		30	16,484	-65.6					27	31	16,381	-61.4	
80----	26	17,669	-58.6		25	17,827	-68.1		23	17,833	-59.8		28	17,796	-63.8		28	17,841	-64.6					23	31	17,677	-60.1	
60----	21	19,494	-57.8		23	19,580	-63.0		19	19,644	-59.2		26	19,563	-62.0		25	19,610	-62.1					20	31	19,569	-58.8	
50----	17	20,658	-57.8		22	20,710	-60.0		18	20,783	-58.3		25	20,691	-60.4		18	20,741	-60.0					20	31	20,712	-58.2	
40----	8	22,046	-57.7		22	22,112	-56.7						22	22,093	-58.5		13	22,167	-56.8					16	31	22,115	-57.1	
30----					17	23,948	-53.8						21	23,913	-56.0		5	23,944	-55.2					10	31	23,969	-55.3	
20----													8	26,550	-53.2													
15----													5	28,408	-52.1													

Standard pressure surface (mb.)	MERIDA, MEXICO (1011 MB.)				MIAMI, FLA. (1014 MB.)				NANTUCKET, MASS. (1016 MB.)				NASHVILLE, TENN. ( 998 MB.)				NORTH PLATTE, NEBR. ( 920 MB.)				OAKLAND, CALIF. (1016 MB.)				OKLAHOMA CITY, OKLA. ( 973 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	27	25.0	82	31	4	23.0	82	31	14	12.2	91	31	177	16.5	61	31	848	11.8	58	31	6	15.8	72	31	391	16.5	76
1,000----	31	124	24.7	80	31	129	23.2	77	31	147	13.7	78	31	169	18.3		31	131			31	138	16.4	63	31	152		
950----	31	575	22.4	78	31	575	20.6	76	31	579	12.2	65	31	598	18.0	43	31	573			31	579	16.2	47	31	595	19.0	55
900----	31	1,043	19.5	76	31	1,041	17.6	75	31	1,030	10.1	60	31	1,060	14.6	46	31	1,029	14.9	48	31	1,033	14.4	36	31	1,056	16.4	56
850----	31	1,534	16.6	73	31	1,527	14.7	71	31	1,504	7.9	56	31	1,540	11.3	47	31	1,511	12.8	46	31	1,513	12.0	30	31	1,540	13.7	53
800----	31	2,048	14.0	64	31	2,038	12.1	66	31	2,002	5.7	48	31	2,043	8.4	42	31	2,017	9.9	45	31	2,018	9.7	25	31	2,048	11.1	48
750----	31	2,595	12.0	51	31	2,581	9.7	58	31	2,531	3.0	45	31	2,579	5.6	36	31	2,554	6.4	47	31	2,560	6.7	24	31	2,592	8.0	42
700----	31	3,168	9.6	45	31	3,147	6.8	53	31	3,084	-1.4	42	31	3,135	2.9	28	31	3,113	2.8	48	31	3,115	3.9		31	3,149	4.4	43
650----	31	3,783	6.4	43	31	3,755	3.8	44	31	3,675	-3.1	38	31	3,737	-4.4		31	3,713	-1.3	45	31	3,718			31	3,756	1.1	39
600----	31	4,432	3.0	39	30	4,399	0.0	41	31	4,303	-6.5	34	31	4,367	-4.2		31	4,343	-4.9	34	31	4,350	-3.3		31	4,387	-3.0	34
550----	30	5,131	-1.3	41	30	5,091	-3.8	42	31	4,976	-11.0		31	5,050	-8.6		29	5,022	-9.5	29	31	5,034	-7.8		30	5,076	7.5	
500----	30	5,883	-5.7	40	30	5,838	-8.4	39	31	5,702	-15.6		31	5,779	-13.5		29	5,749	-14.7		31	5,768	-12.9		30	5,805	-12.3	
450----	29	6,709	-10.7	37	30	6,656	-13.5	35	31	6,495	-21.3		31	6,575	-19.3		29	6,545	-20.8		30	6,571	-18.9		29	6,610	-18.1	
400----	27	7,597	-16.7	36	30	7,535	-19.6	36	31	7,348	-27.2		31	7,436	-25.7		29	7,397	-27.3		30	7,431	-25.6		28	7,468	-24.7	
350----	26	8,586	-23.6		30	8,511	-26.7		29	8,298	-34.0		31	8,389	-32.9		29	8,343	-34.6		29	8,3833						



# RADIOSONDE DATA

Average monthly values

OCTOBER 1953

Table 20—Continued

SAN JUAN, P. R. (1012 MB.)				SANTA MARIA, CALIF. (1007 MB.)				S. STE. MARIE, MICH. (993 MB.)				SPOKANE, WASH. (934 MB.)				SWAN ISLAND, W. I. (1011 MB.)				TACUBAYA, MEXICO (774 MB.)				TAMPA, FLA. (1016 MB.)				
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	19	25.7	83	31	71	13.8	75	31	221	7.5	87	31	722	11.0	59	31	10	26.8	83	31	2,306	15.5	69	31	7	20.6	83
1,000--	31	127	25.5	81	31	129	14.4	70	31	160			31	147			31	108	26.7	79	31	72			31	141	21.9	74
950--	31	585	22.9	80	31	575	18.0	40	31	593	9.8	61	31	586			31	564	23.4	80	31	534			31	589	19.2	70
900--	31	1,048	19.9	78	31	1,027	16.6	33	31	1,034	8.0	58	31	1,037	12.1	49	31	1,031	20.7	75	31	1,011			31	1,048	16.2	67
850--	31	1,540	17.2	73	31	1,511	13.9	31	31	1,504	6.2	51	31	1,513	9.2	48	31	1,524	17.7	74	31	1,502			31	1,532	13.4	65
800--	31	2,056	14.3	66	31	2,019	11.2	23	31	1,999	4.4	46	31	2,013	6.3	48	31	2,040	14.8	72	31	2,031			31	2,040	11.1	57
750--	31	2,604	11.7	54	31	2,562	8.2	21	31	2,526	1.6	45	31	2,546	3.0	51	31	2,591	12.0	68	31	2,582	14.0	65	31	2,588	8.6	46
700--	31	3,173	8.8	47	31	3,121	5.0	22	31	3,075	-1.3	43	31	3,095	-3.3	52	31	3,160	9.1	64	31	3,155	9.9	69	31	3,145	5.7	40
650--	31	3,792	5.5	41	31	3,725	1.8	30	3,667	-4.7	43	31	3,692	-3.6	50	31	3,777	5.7	60	31	3,775	5.5	75	31	3,759	2.8		
600--	31	4,433	2.1	32	31	4,362	-1.9	29	4,288	-8.9	47	31	4,312	-7.3	48	31	4,422	2.2	56	31	4,418	1.4	79	31	4,391	-1.8		
550--	31	5,130	-2.0		31	5,045	-6.5	29	4,958	-13.0	44	31	4,989	-11.2	44	31	5,120	-1.6	52	31	5,122	-2.5	78	31	5,087	-4.7		
500--	31	5,881	-6.5		31	5,785	-12.0	29	5,676	-18.0		31	5,710	-15.7	37	31	5,873	-5.8	42	31	5,867	-6.4	66	31	5,824	-9.5		
450--	31	6,708	-11.9		31	6,588	-17.9	29	6,464	-23.4		31	6,503	-21.2	36	31	6,700	-11.0	39	31	6,694	-11.3	57	31	6,644	-14.7		
400--	31	7,587	-18.1		31	7,452	-24.5	29	7,308	-29.7		31	7,355	-27.5	37	31	7,585	-16.7	39	30	7,578	-17.0	48	31	7,513	-20.7		
350--	31	8,569	-25.4		31	8,408	-32.2	29	8,244	-37.2		31	8,300	-34.8		31	8,574	-23.8	37	29	8,568	-24.0	51	30	8,485	-28.0		
300--	31	9,667	-33.8		31	9,476	-40.9	29	9,292	-44.9		31	9,358	-42.9		31	9,679	-32.3	36	29	9,674	-32.3		30	9,573	-36.0		
250--	31	10,916	-44.0		31	10,690	-49.7	29	10,489	-52.0		31	10,563	-51.5		31	10,937	-42.5		27	10,932	-42.9		30	10,813	-45.2		
200--	31	12,375	-55.3		31	12,127	-56.2	27	11,912	-56.2		31	11,991	-56.7		31	12,402	-54.7		23	12,400	-55.1		30	12,270	-55.0		
175--	31	13,213	-61.4		31	12,969	-59.0	25	12,759	-57.0		31	12,833	-58.5		30	13,243	-61.6		21	13,238	-62.0		30	13,112	-59.9		
150--	30	14,153	-67.5		31	13,929	-61.3	18	13,739	-58.2		31	13,799	-59.2		27	14,183	-68.7		14	14,177	-69.1		29	14,057	-64.5		
125--	30	15,234	-73.2		31	15,052	-64.0	15	14,876	-59.7		30	14,940	-59.9		23	15,257	-75.3		9	15,243	-74.3		29	15,157	-69.1		
100--	30	16,531	-75.3		31	16,412	-65.0	5	16,331	-61.7		29	16,333	-60.0		20	16,532	-78.6						27	16,479	-71.4		
80--	27	17,825	-73.6		28	17,771	-64.1					28	17,727	-58.9		13	17,811	-74.0					26	19,541	-63.6			
60--	25	19,539	-66.1		23	19,545	-61.2					28	19,535	-57.6		11	19,522	-66.3					24	20,667	-60.4			
50--	22	20,653	-62.3		20	20,681	-59.4					26	20,687	-57.5		10	20,637	-61.5					19	22,066	-57.0			
40--	21	22,041	-59.1		13	22,098	-57.1					20	22,085	-57.1		10	22,026	-59.3					14	23,906	-53.3			
30--	16	23,857	-56.3									8	23,940	-55.8		9	23,855	-55.2					7	26,538	-49.6			
20--	9	26,448	-51.8													7	26,472	-50.3										
15--																6	28,341	-46.8										

TATOOSH ISLAND, WASH. (1014 MB.)				VERACRUZ, MEXICO (1011 MB.)				WASHINGTON, D. C. (1009 MB.)				
SURFACE	31	31	11.9	88	31	13	26.7	73	31	88	13.5	73
1,000--	31	145	12.1	83	31	113	25.9	74	31	162	16.1	65
950--	31	577	11.0	73	31	559	22.4	75	31	605	15.4	57
900--	31	1,024	8.6	66	31	1,033	19.3	74	31	1,055	12.8	52
850--	31	1,494	6.0	64	31	1,523	16.1	79	31	1,533	10.3	49
800--	31	1,989	3.7	57	31	2,037	13.3	79	31	2,035	7.6	48
750--	31	2,515	1.5	57	31	2,584	11.0	67	31	2,570	4.5	46
700--	31	3,064	-1.3	57	31	3,153	8.7	58	31	3,123	1.8	36
650--	31	3,657	-4.5	52	30	3,767	5.6	61	31	3,723	-1.5	33
600--	30	4,279	-8.0	44	30	4,414	1.8	63	31	4,349	-5.5	31
550--	30	4,953	-12.2	40	29	5,109	-2.2	59	31	5,032	-9.4	
500--	30	5,672	-16.7	41	29	5,863	-6.6	52	31	5,757	-14.0	28
450--	30	6,461	-21.9	38	29	6,687	-11.3	44	31	6,556	-19.8	33
400--	30	7,313	-27.9	40	28	7,574	-17.0	40	31	7,412	-26.2	35
350--	30	8,256	-35.2	40	28	8,563	-23.8		31	8,362	-33.3	
300--	30	9,311	-43.2		27	9,671	-32.2		30	9,421	-41.0	
250--	30	10,515	-51.7		25	10,934	-42.0		30	10,636	-48.7	
200--	28	11,944	-57.1		25	12,404	-54.5		30	12,079	-54.4	
175--	28	12,786	-57.8		21	13,243	-61.4		30	12,929	-56.7	
150--	26	13,756	-58.9		16	14,189	-68.9		29	13,894	-59.2	
125--	23	14,914	-59.6		10	15,248	-75.4		29	15,028	-61.6	
100--	23	16,308	-59.1		8	16,531	-78.2		29	16,405	-62.7	
80--	18	17,707	-58.1						28	17,781	-61.1	
60--	15	19,527	-57.3						22	19,578	-59.2	
50--	8	20,704	-58.9						18	20,723	-58.0	
40--	5	22,086	-59.4						17	22,138	-55.9	
30--									15	23,986	-53.9	
20--									7	26,647	-50.6	
15--									5	28,562	-48.3	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and

expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

## Average monthly resultant winds

Table 21

OCTOBER 1953

[illegible]

* Rawin Data (Cont'd)				
18,000 m.	30 obs.	279 dir.	4.8	speed
20,000 m.	28 obs.	271 dir.	1.6	speed
22,000 m.	26 obs.	272 dir.	1.8	speed
24,000 m.	25 obs.	257 dir.	3.3	speed
26,000 m.	19 obs.	256 dir.	1.7	speed

\*\* Rawin Data (Cont'd)  
18,000 m., 15 obs., 290 dir., 9.2 speed

† Rawin Data (Cont'd)				
18,000 m.,	26 obs.,	254 dir.,	9.3	speed
20,000 m.,	26 obs.,	252 dir.,	6.1	speed
22,000 m.,	24 obs.,	249 dir.,	5.1	speed
24,000 m.,	19 obs.,	256 dir.,	6.2	speed

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.



# RAWIN DATA

Average monthly resultant winds

Table 22--Continued

OCTOBER 1950

Altitude (meters) m.a.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			Int. Falls, Minn. (358 m.)			
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed				
Surface-----	31	116	3.4	31	131	3.9	31	80	0.6	31	89	1.8	31	69	2.3	31	291	1.4	31	354	1.1	31	134	1.4	30	339	2.1	31	19	0.6	31	351	2.5	31	150	1.2	
500-----	---	---	---	---	---	---	---	---	---	31	100	4.6	31	59	3.7	31	310	3.8	30	48	3.7	31	156	1.8	---	---	---	---	---	---	---	---	---	---	---	---	
1,000-----	---	---	---	31	140	5.9	30	199	2.9	31	100	4.0	30	59	3.9	31	315	5.5	30	43	3.3	31	215	2.1	---	---	---	---	---	---	---	---	---	---	---		
1,500-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
2,000-----	31	164	3.9	30	172	2.8	30	279	4.7	31	64	1.6	29	53	3.4	31	298	7.0	31	49	2.7	31	245	2.4	30	337	2.1	31	354	2.0	31	13	2.1	31	250	6.1	
2,500-----	31	208	3.9	30	221	1.9	31	290	5.6	31	21	1.2	29	35	3.0	31	293	8.2	30	36	3.3	31	284	2.7	30	258	1.8	31	356	2.3	29	333	3.0	30	279	6.1	
3,000-----	31	226	3.8	30	263	1.8	31	285	6.1	31	311	1.3	29	357	2.8	31	283	9.3	30	11	2.0	31	292	3.3	30	234	2.4	31	347	1.7	28	324	2.5	30	286	7.9	
4,000-----	31	250	4.4	30	255	5.4	30	278	6.4	29	293	2.4	28	310	3.7	29	287	12.5	28	290	1.1	31	304	4.4	30	202	3.8	31	298	2.7	28	299	4.1	30	292	9.6	
5,000-----	29	260	4.9	30	258	6.1	29	288	8.9	26	293	4.3	27	297	6.3	28	277	14.8	26	296	4.0	30	286	5.5	30	212	3.0	31	299	5.3	27	297	4.7	29	295	12.9	
6,000-----	28	269	4.8	30	256	8.1	29	285	8.7	25	283	5.5	29	287	7.3	26	270	14.7	24	282	5.0	30	273	6.8	29	232	3.0	31	293	6.9	28	279	5.9	28	296	15.3	
8,000-----	25	271	4.8	29	263	10.9	25	272	10.1	22	274	10.1	28	278	14.3	20	258	14.7	23	262	11.2	30	276	8.7	26	289	3.1	31	282	8.9	28	260	10.3	26	280	16.9	
10,000-----	23	280	8.0	28	262	17.2	24	284	9.7	19	281	15.3	22	271	18.2	15	258	18.2	24	254	17.6	29	278	12.3	26	293	5.4	27	277	10.6	27	250	17.0	16	288	16.4	
12,000-----	18	288	11.3	26	266	22.5	21	278	12.3	18	271	17.1	22	278	20.8	12	250	19.3	22	255	22.0	25	277	14.8	22	271	9.2	25	258	15.2	25	252	21.1	---	---	---	
14,000-----	18	284	10.7	22	271	19.5	18	272	11.2	15	284	12.6	20	276	14.9	11	260	18.4	19	264	18.4	22	277	15.0	19	271	8.5	24	267	15.3	21	270	14.3	---	---	---	
16,000-----	16	282	8.7	20	272	9.9	17	284	7.6	---	---	---	---	---	---	18	276	6.8	10	258	14.9	16	271	8.9	18	283	11.1	15	251	8.7	16	287	9.3	21	276	11.3	
18,000-----	15	310	4.5	16	302	5.8	14	310	5.8	---	---	---	---	---	---	18	337	1.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
20,000-----	12	34	2.5	---	---	---	---	---	---	---	---	---	---	---	---	15	72	3.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
22,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	11	99	4.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P.R. (28 m.)			Santa Maria, Calif. (72 m.)			
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	
Surface-----	31	44	0.8	31	186	0.9	31	28	1.4	31	3	1.1	31	310	0.8	31	300	1.6	31	116	2.3	31	359	0.8	31	190	0.7	31	124	1.6	31	146	2.1	31	261	1.0	
500-----	31	107	2.5	30	190	7.3	31	68	3.3	30	299	2.7	31	24	1.6	29	325	3.3	29	137	3.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,000-----	31	107	1.2	30	29	4.3	31	72	2.6	30	299	3.6	31	30	1.0	29	338	2.7	29	174	4.2	31	9	5.5	30	223	4.4	29	131	4.2	31	95	5.8	31	24	4.0	
1,500-----	31	228	3.0	31	131	4.3	31	80	1.5	30	283	3.7	31	124	2.2	29	338	1.7	28	219	2.7	31	237	2.1	29	249	4.8	29	134	3.1	31	92	5.2	31	31	3.5	
2,000-----	31	303	1.0	30	173	1.6	31	109	9.30	274	3.8	31	304	5.29	296	7.28	259	2.2	31	263	3.5	29	267	5.8	29	137	2.4	31	90	4.3	31	30	2.7				
2,500-----	31	315	1.7	30	193	2.7	31	239	1.1	31	255	4.1	31	306	1.6	31	326	7.28	288	2.4	31	272	5.2	29	281	5.9	29	135	1.6	31	81	4.0	31	17	2.2		
3,000-----	30	317	1.7	31	243	2.7	31	251	2.9	31	257	5.1	31	308	2.7	30	309	1.5	30	295	3.6	31	280	4.8	29	279	7.2	30	164	5.31	82	3.7	31	340	2.6		
4,000-----	30	293	2.8	30	275	3.5	30	270	4.3	30	265	7.1	29	312	4.0	30	304	4.6	29	298	4.0	31	286	6.4	30	284	8.4	30	276	1.8	31	76	3.1	30	310	4.0	
5,000-----	30	299	3.6	28	284	3.0	28	277	7.1	29	255	8.1	28	307	5.5	30	292	7.0	28	286	4.5	31	288	7.3	30	289	9.3	30	271	3.8	31	75	2.0	30	306	6.1	
6,000-----	30	293	5.0	25	293	5.0	28	277	8.5	27	260	11.2	28	306	6.9	29	289	7.8	26	271	6.6	30	268	7.9	28	286	11.7	30	266	5.9	31	61	1.1	30	306	7.7	
8,000-----	30	287	9.2	24	301	10.7	28	278	13.8	26	261	15.2	28	293	9.9	23	293	7.8	24	282	10.2	28	275	8.8	27	300	12.8	29	265	11.5	31	7	9	28	293	10.5	
10,000-----	28	292	12.7	20	281	9.2	27	266	16.6	22	265	18.0	29	293	12.9	22	297	9.0	24	257	13.9	27	271	9.1	24	284	15.6	24	273	16.6	31	13	3.4	26	287	7.9	
12,000-----	25	285	19.3	18	271	12.2	26	268	21.2	16	256	15.5	25	293	15.7	18	303	9.9	22	266	20.2	25	275	12.1	21	281	14.8	23	278	22.7	31	340	8.0	24	289	11.0	
14,000-----	21	279	18.5	14	264	14.1	22	269	16.6	11	255	10.2	23	289	16.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
16,000-----	18	291	13.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
18,000-----	13	294	7.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
20,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
22,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
24,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D.C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface-----	31	30	0.6	31	210	1.2	29	130	2.6	31	104	0.5
500-----	31	308	1.9	---	---	---	---	---	---	---	---	---
1,000-----	31											

# SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun.

TABLE MOUNTAIN, CALIF.									
Sun's zenith distance									
Date	A. M.				00°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
Air mass									
	3.76	3.01	2.26	1.51	*1.0	1.51	2.26	3.01	3.76
October 11-----				1.44					
12-----				1.43					
13-----				1.41					
15-----				1.42					
18-----	1.11	1.20	1.30	1.44					
27-----	1.09	1.18	1.29	1.42					
28-----	1.06	1.15	1.27	1.40					
29-----	1.09	1.17	1.28	1.41					
31-----				1.41					
Averages	1.09	1.16	1.29	1.42					
Departures	-.07	-.07	-.06	-.05					
LINCOLN, NEBR.									
Air mass									
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
October 1-----	0.72	0.79	0.92	1.09	1.27	0.86	0.77	0.62	0.52
5-----	.79	.90	1.01	1.16	1.36	1.17	1.01	.88	.75
6-----	.81	.92	1.05	1.20	1.41	1.25	1.12	.99	.88
7-----					1.32	1.12	.90	.79	.71
8-----					1.31	1.10	.94	.82	.69
10-----	.58	.68	.81	1.01	1.18				
12-----	.52	.62	.75	.94					
13-----		.56	.73	.96	1.16	1.01	.73	.58	.47
14-----	.47	.58	.73	.94	1.14	.90	.69	.56	.45
17-----					.88	.71	.56	.47	
20-----						.82	.71	.60	
23-----					1.34	1.18	1.01	.90	.79
26-----	.73	.88	1.05	1.20	1.42				
29-----	.83	.94	1.03	1.22	1.43	1.23	1.08	.94	.84
30-----	.83	.94	1.05	1.20	1.42				
31-----				1.14	1.33	1.16	.99	.86	.75
Averages	.70	.78	.91	1.10	1.31	1.08	.90	.77	.66
Departures	.07	.11	.14	-.14	-.10	-.13	-.13	-.13	-.13
BOSTON, MASS.									
Air mass									
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
NO DATA DURING OCTOBER 1953									
MADISON, WIS.									
Air mass									
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
NO DATA DURING OCTOBER 1953									

ALBUQUERQUE, N. MEX.									
Sun's zenith distance									
Date	A. M.				00°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
Air mass									
	4.08	3.26	2.44	1.63	*1.0	1.63	2.44	3.26	4.08
October 1-----	0.76	0.86	0.99	1.16		1.23	1.06	0.90	0.80
2-----		.88	1.02	1.19		1.23	1.08	.91	.80
3-----		.85				.93	.75	.56	.42
4-----	.66	.78	.89	1.10			1.04	.91	.79
5-----	.68	.87	1.03	1.28		1.28	1.14	1.08	.99
6-----	.87	.98	1.11	1.26		1.29	1.10	.94	.84
7-----	.64	.84	1.01	1.25		1.15	1.04	.91	.72
8-----	.82	.95	1.08	1.26		1.35	1.15	1.06	.94
9-----	.88	1.02	1.16	1.33		1.36	1.16	1.06	.90
10-----	.92	1.04	1.16	1.34		1.34	1.18	1.06	.92
11-----	.88	1.04	1.16	1.35					
13-----		1.10	1.30			1.32	1.15	1.04	.91
14-----	.94	1.09	1.20	1.38		1.36	1.16	1.10	.94
15-----	1.09	1.18	1.26	1.39					1.00
16-----	.95	1.11	1.21	1.40		1.41			
18-----						1.43			
19-----	.91	1.02	1.15	1.32					
20-----	.93	.96		1.30					
21-----			1.13	1.32		1.32	1.13	.99	.85
22-----	.92	1.05	1.16	1.30					
23-----	.90	1.03					1.11	.97	.87
24-----		.92	1.03	1.22		1.26	1.06	.92	.80
25-----	.86	1.00	1.14	1.31		1.29	1.10	.98	.83
26-----	.81	.94	1.10	1.27		1.29	1.14	1.01	.84
27-----	.93	1.03	1.14			1.33	1.18	1.05	.93
28-----	1.04	1.14	1.24	1.35		1.32	1.16	1.01	.87
29-----	.96	1.08	1.20						
30-----				1.33		1.30		.97	.86
31-----	.90	1.01	1.17	1.33		1.32	1.18	1.01	.93
Averages	.87	.99	1.12	1.25		1.28	1.10	.97	.85
Departures	-.06	-.05	-.05	-.05		-.15	-.08	-.09	-.09
BLUE HILL, MASS.									
Air mass									
	4.86	3.89	2.92	1.94	*1.0	1.94	2.92	3.89	4.86
October 1-----	0.51	0.69	0.92	1.18		1.29	1.13	1.01	0.90
2-----	.94	1.03	1.14	1.28		1.26	1.07	.94	.79
3-----	.79	.90	1.01	1.19		1.09	.94	.79	.71
4-----	.90	.95	1.11	1.32		1.30	1.15	1.03	.92
10-----	.44	.57	.71	.92		.83	.48	.44	.30
13-----	.97	1.09	1.18	1.30		1.32	1.12	.97	.88
14-----	.99	1.09	1.21	1.37		1.34	1.19	1.05	.93
15-----	.63	.76	.90	1.09		.95	.73	.59	.46
16-----	.87	1.00	1.09	1.30		1.28	1.14	1.03	.91
17-----	.91	1.04	1.16	1.32		1.25	1.10	.98	.87
18-----	1.01	1.11	1.28	1.33		1.26	1.06		
Averages	.81	.93	1.06	1.24		1.20	1.01	.88	.77
Departures	-.04	-.02	-.02	+.02		.00	-.01	.01	.00

\* Extrapolated

\* Extrapolated

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of

pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.



# SOLAR RADIATION DATA

OCTOBER 1953

Table 31a Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

	Avg							Avg							Avg						
Date-----	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Langleys-----	95	114	119	116	20	35	112	89	132	113	108	98	100	84	71	101	79	80	77	78	86
Date-----	22	23	24	25	26	27	28	29	30	31	1	2	3	4							
Langleys-----	31	24	71	16	61	85	50	49	46	15	48	89	69	84	87	63					

Table 31b Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

	Avg							Avg							Avg						
Date-----	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Langleys-----	268	283	273	265	26	27	77	174	290	271	247	66	120	283	292	225	243	263	267	240	133
Date-----	22	23	24	25	26	27	28	29	30	31	1	2	3	4							
Langleys-----	27	21	109	13	84	107	46	58	33	12	34	69	160	126	105	77					

Table 31c Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

	Avg							Avg							Avg						
Date-----	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Langleys-----	501	-	-	-	-	25	135	198	521	510	433	76	259	515	542	413	474	516	501	508	246
Date-----	22	23	24	25	26	27	28	29	30	31	1	2	3	4							
Langleys-----	33	20	397	-	146	195	78	145	30	13	86	232	379	162	206	158					

Table 31d Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

	Avg							Avg							Avg						
Date-----	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Langleys-----	301	205	272	245	21	23	134	183	299	263	207	77	184	291	278	229	214	256	247	242	135
Date-----	22	23	24	25	26	27	28	29	30	31	1	2	3	4							
Langleys-----	29	17	231	11	79	85	71	75	28	11	112	194	174	87	149	108					

Table 31e Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

	Avg							Avg							Avg						
Date-----	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Langleys-----	44	41	49	64	25	30	95	50	77	71	93	111	135	68	51	86	76	50	50	50	130
Date-----	22	23	24	25	26	27	28	29	30	31	1	2	3	4							
Langleys-----	47	25	80	13	109	104	63	63	42	18	57	98	81	118	121	76					

Note: Langley is the unit used to denote one gram calorie per square centimeter

# SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

OCTOBER 1953

1953	Albuquerque, N. Mex.	Apalachicola, Fla.	Astoria, Ore.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Big Spring, Texas	Bismark, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Brownsville, Texas	Canton Island, Pacific Area	Caribou, Me.	Charleston, S. C.	Columbia, Mo.	Columbus, Ohio	Davis, Calif.	Dodge City, Kans.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Texas	Ely, Nevada	Fairbanks, Alaska	Fort Worth, Texas	Fresno, Calif.	Grand Junction, Colo.	Great Falls, Mont.	Greensboro, N. C.	Griffin, Ga.	Halters, N. C.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Lake Charles, La.	
Oct. 1-----	556	443	234	342	140	284	436	404	483	313	318	724	304	255	499	508	450	410	374	423	232	598	526	219	575	546	435	302	321	356	426	467	600	480	457	
Oct. 2-----	552	556	202	467	246	284	413	335	484	427	225	689	413	391	411	455	470	410	374	423	232	598	526	219	575	546	435	302	321	356	426	467	600	480	457	
Oct. 3-----	510	515	394	452	164	244	436	404	483	313	318	724	304	255	499	508	450	410	374	423	232	598	526	219	575	546	435	302	321	356	426	467	600	480	457	
Oct. 4-----	512	515	394	452	164	244	436	404	483	313	318	724	304	255	499	508	450	410	374	423	232	598	526	219	575	546	435	302	321	356	426	467	600	480	457	
Oct. 5-----	542	442	402	550	--	203	345	318	448	394	373	675	414	483	51	346	435	474	136	419	295	456	(510)	89	120	510	539	429	487	556	(378)	179	582	218	491	
Oct. 6-----	544	526	382	--	(48)	227	544	387	431	310	216	--	318	417	534	74	438	484	337	100	295	456	510	89	120	510	539	429	487	556	(378)	179	582	218	491	
Oct. 7-----	543	530	309	425	34	121	536	410	--	487	424	--	177	432	512	426	375	463	194	254	582	503	176	580	463	406	496	403	480	557	539	485	519	30	563	
Oct. 8-----	544	546	346	603	--	227	533	386	176	375	563	721	--	492	512	426	375	463	194	254	582	503	176	580	463	406	496	403	480	557	539	485	519	30	563	
Averages-----	541	508	310	473	(126)	227	423	(380)	307	374	353	681	259	412	377	355	434	(464)	279	293	(217)	552	(504)	140	463	(506)	508	400	405	467	(391)	327	564	263	489	
Departures-----	--	--	--	--	--	--	--	--	+1	--	--	--	--	--	--	--	+22	--	+26	-2	--	--	--	+24	--	+66	--	--	--	--	--	--	-13	--		
Oct. 9-----	531	363	115	472	--	161	515	(383)	470	334	490	--	273	354	489	443	401	471	326	420	151	576	506	68	577	471	434	308	442	513	512	396	549	430	559	
Oct. 10-----	535	323	105	277	--	101	500	323	439	350	552	628	94	48	490	422	418	476	308	361	147	562	499	122	553	492	559	331	397	437	141	392	553	434	531	
Oct. 11-----	532	534	348	492	--	65	510	350	392	160	537	--	81	139	482	417	273	453	226	364	233	572	379	46	544	395	441	356	460	511	334	397	541	381	525	
Oct. 12-----	542	462	--	--	--	121	510	321	143	363	531	628	300	453	480	407	454	456	286	151	239	569	469	37	538	440	369	340	440	525	438	392	544	--	--	
Oct. 13-----	469	(508)	321	485	--	139	484	243	246	356	543	--	235	449	463	425	440	452	271	213	(242)	495	363	145	529	488	394	360	147	506	448	375	538	--	504	
Oct. 14-----	509	509	70	--	--	156	447	340	445	341	516	(773)	310	408	451	427	350	(195)	321	386	264	542	428	110	570	470	457	362	410	467	369	396	525	478	489	
Averages-----	509	(455)	235	443	--	119	478	(329)	362	320	511	--	233	296	470	413	362	(377)	288	325	(217)	552	438	83	357	466	448	448	401	366	343	531	399	489	514	
Departures-----	--	--	--	--	--	--	--	--	+55	--	--	--	--	--	--	--	-16	--	+58	--	--	--	--	-2	--	+53	--	450	344	404	480	381	527	404	514	
Oct. 15-----	501	401	318	124	(45)	146	395	337	344	203	342	--	148	347	427	378	338	265	280	340	210	539	447	120	472	451	309	330	388	184	438	371	527	336	473	
Oct. 16-----	499	449	104	--	--	75	189	458	128	368	459	--	350	413	445	399	383	415	292	355	236	525	455	120	472	451	309	330	388	184	438	371	527	336	473	
Oct. 17-----	496	447	72	--	--	29	76	422	312	388	281	451	--	320	413	445	399	383	415	292	355	236	525	455	120	472	451	309	330	388	184	438	371	527	336	473
Oct. 18-----	364	460	264	368	20	68	272	317	353	42	494	--	320	172	423	339	278	321	296	360	108	121	434	111	436	250	447	202	338	399	260	366	496	355	463	
Oct. 19-----	391	490	282	399	(37)	134	428	284	186	325	502	654	228	359	359	339	428	406	183	210	223	504	162	115	417	388	223	301	384	375	272	328	350	305	--	
Oct. 20-----	402	476	218	416	(40)	66	290	260	230	462	71	123	400	387	366	321	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	
Oct. 21-----	477	461	308	396	--	45	432	76	41	309	426	731	168	377	328	310	426	427	243	64	424	507	330	41	198	429	318	135	366	411	385	331	434	253	393	
Averages-----	417	455	224	341	(41)	103	385	246	269	243	448	--	239	352	397	364	380	371	263	275	192	434	368	(99)	412	406	344	277	375	390	365	351	459	329	455	
Departures-----	--	--	--	--	--	--	--	--	-17	--	--	--	--	--	--	--	+26	--	+31	+5	--	--	--	+23	--	+36	--	--	--	--	--	--	+64	--		
Oct. 22-----	451	447	321	383	32	61	162	76	54	217	199	--	293	361	188	369	415	137	250	68	223	431	127	63	268	462	188	339	236	391	215	312	404	310	436	
Oct. 23-----	498	437	303	428	21	183	74	321	27	192	360	--	251	402	358	263	377	(131)	208	76	220	272	230	48	189	423	234	334	413	111	111	166	497	312	247	
Oct. 24-----	480	412	187	435	52	153	--	84	261	306	391	--	267	371	435	139	398	156	15	111	153	460	113	78	304	424	364	319	345	424	406	118	490	108	356	
Oct. 25-----	469	407	271	443	18	108	--	187	14	311	344	703	300	420	273	240	393	142	27	176	509	433	39	264	421	381	241	387	458	411	210	486	388	220	356	
Oct. 26-----	437	421	281	415	--	87	453	152	140	230	164	666	76	106	30	333	375	405	139	161	117	475	410	64	210	425	376	(240)	384	153	295	476	328	360	468	
Oct. 27-----	443	79	277	168	10	86	424	238	167	300	187	705	114	126	67	57	349	384	7	196	136	490	398	88	506	(424)	396	299	94	183	269	476	142	468	34	
Oct. 28-----	446	359	65	--	7	140	423	289	82	306	483	704	17	188	409	48	346	394	52	86	166	490	403	98	495	417	396	298	354	160	97	158	468	231	489	
Averages-----	435	366	244	379	23	117	307	191	107	269	305	695	188	325	251	207	379	(256)	100	110	170	447	302	68	320	(428)	318	(295)	318	349	360	210	473	(218)	339	
Departures-----	--	--	--	--	--	--	--	--	-104	--	--	--	--	--	--	--	+61	--	-71	-97	--	--	--	+9	--	+75	--	--	--	--	--	--	+35	--		
Oct. 29-----	421	491	148	493	45	153	415	281	43	298	461	706	67	376	421	93	316	390	276	84	32	63	399	68	497	392	398	245	132	83	308	368	444	24	493	
Oct. 30-----	428	377	70	356	9	78	243	76	20	188	182	--	148	391	401	362	349	318	255	54	106	428	380	67	259	400	385	141	407	379	382	346	445	305	(326)	
Oct. 31-----	431	384	83	390	--	126	232	134	77	265	130	--	126	410	393	366	306	297	71	83	467	379	76	128	383	378	103	392	274	419	295	340	303	160	--	
Nov. 1-----	425	361	164	478	14	43	287	229	179	96	161	719	66	181	293	366	306	297	71	83	467	379	76	128	383	378	103	392	274	419	295	340	303	160	--	
Nov. 2-----	398	356	249	478	13	80	413	272	233	273	124	693	--	387	347	302	348	134	256	147	449	241	78	443	352	194	249	373	349	397	283	371	256	--		
Nov. 3-----	383	356	249	478	13	80	413	272	233	273	124	693	--	387	347	302	348	134	256	147	449	241	78	443	352	194	249	373	349	397	283	371	256	--		
Nov. 4-----	394	152	74	238	7	136	94																													



## SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langieys, —Continued

[illegible]

Accumulated Departures January 1 to November 4, 1953

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

## ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

OCTOBER 1953

Station	Day of month																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
Baltimore, Md.-----	512	519	554	438	363	52	544	519	492	448	378	387	454	441	423	393	400	380	239	306	333	400	408	86	357	381	134	170	32	422	381	369
Blue Hill, Mass.-----	-	-	-	-	-	-	-	-	-	-	405	158	280	448	452	400	436	416	422	260	312	57	76	45	260	28	190	126	69	32	111	241
Philadelphia, Pa.-----	447	456	414	390	220	69	-	462	402	288	298	342	370	356	332	309	324	336	267	132	254	172	292	90	180	285	102	166	22	369	334	286
Washington, D. C. (WBCO)-----	506	541	536	470	391	-	546	520	481	445	419	395	454	394	384	402	-	-	338	334	345	401	431	138	329	359	111	174	25	-	-	379

The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continu-

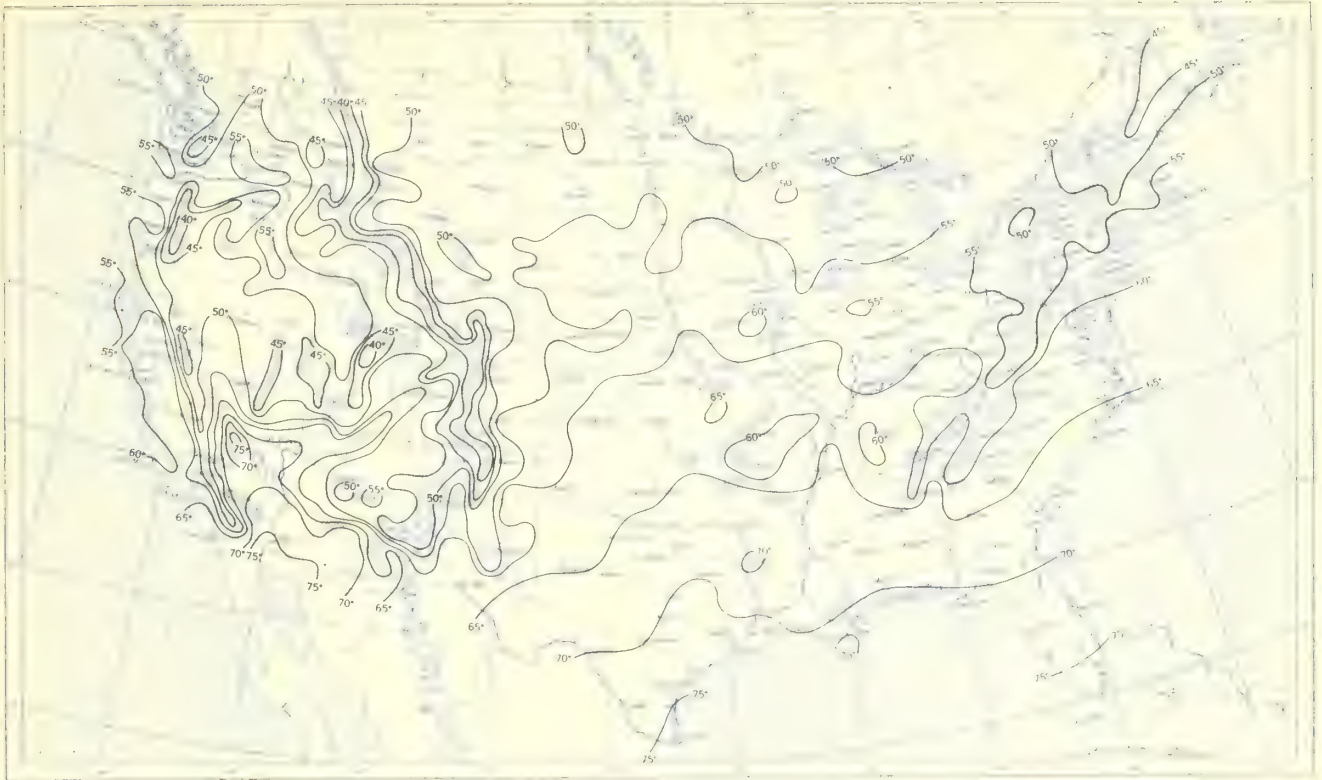
ous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in *Illuminating Engineering*, Vol. XLVI No. 2, pages 59 to 62.

NWRC, Asheville, N.C. --- 1/6/54 --- 2000





Chart I. A. Average Temperature ( $^{\circ}\text{F}$ .) at Surface, October 1953.



B. Departure of Average Temperature from Normal ( $^{\circ}\text{F}$ .), October 1953.



A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.



Chart II. Total Precipitation (Inches), October 1953.



Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), October 1953.



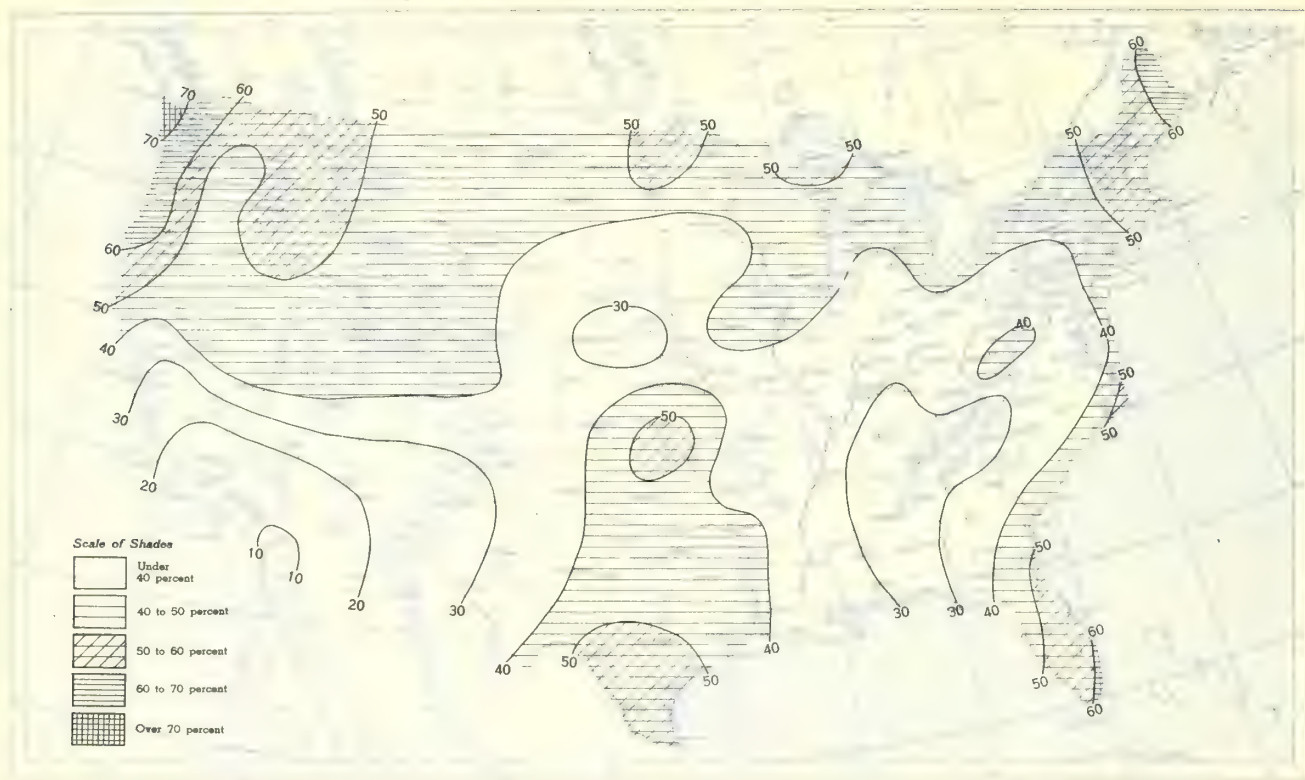
B. Percentage of Normal Precipitation, October 1953.



Normal monthly precipitation amounts are computed for stations having at least 10 years of record.



Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, October 1953.

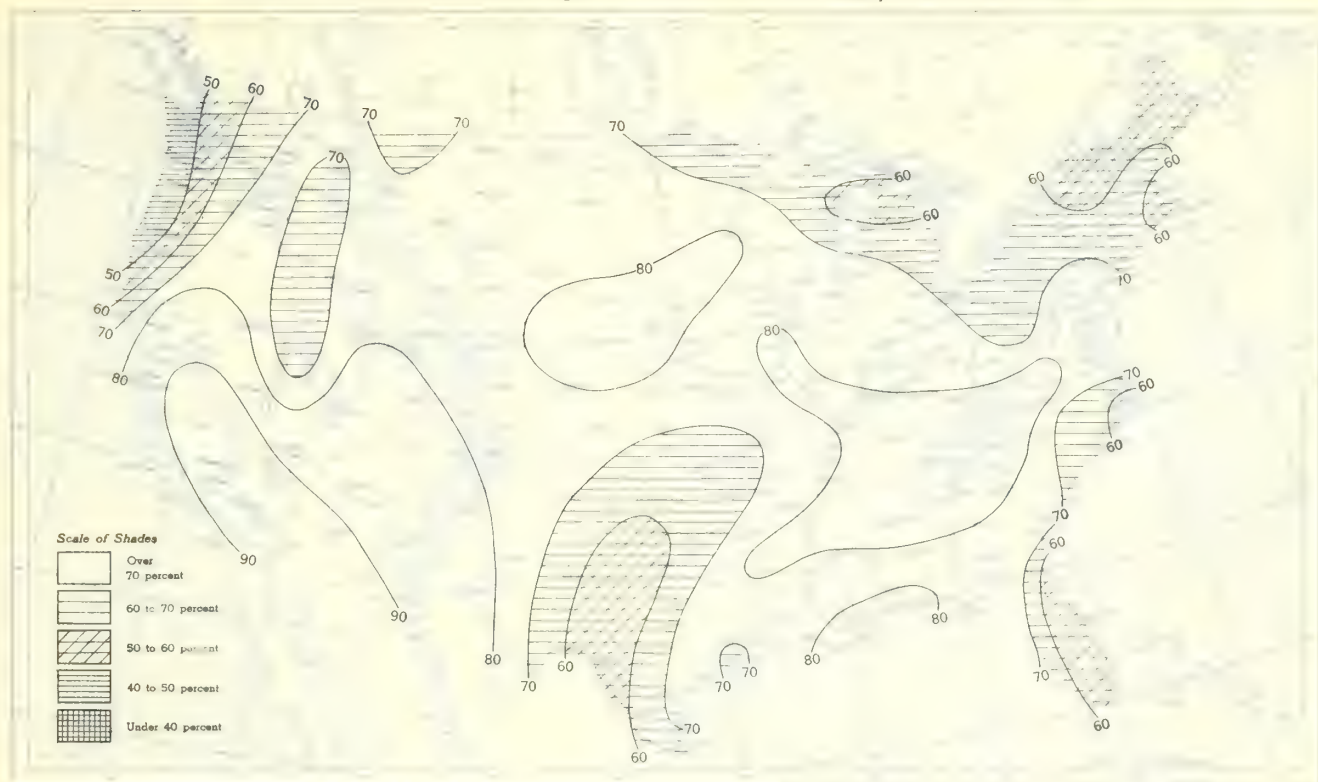


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, October 1953.



A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, October 1953.



B. Percentage of Normal Sunshine, October 1953.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.



Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, October 1953. Inset: Percentage of Normal Average Daily Solar Radiation, October 1953.

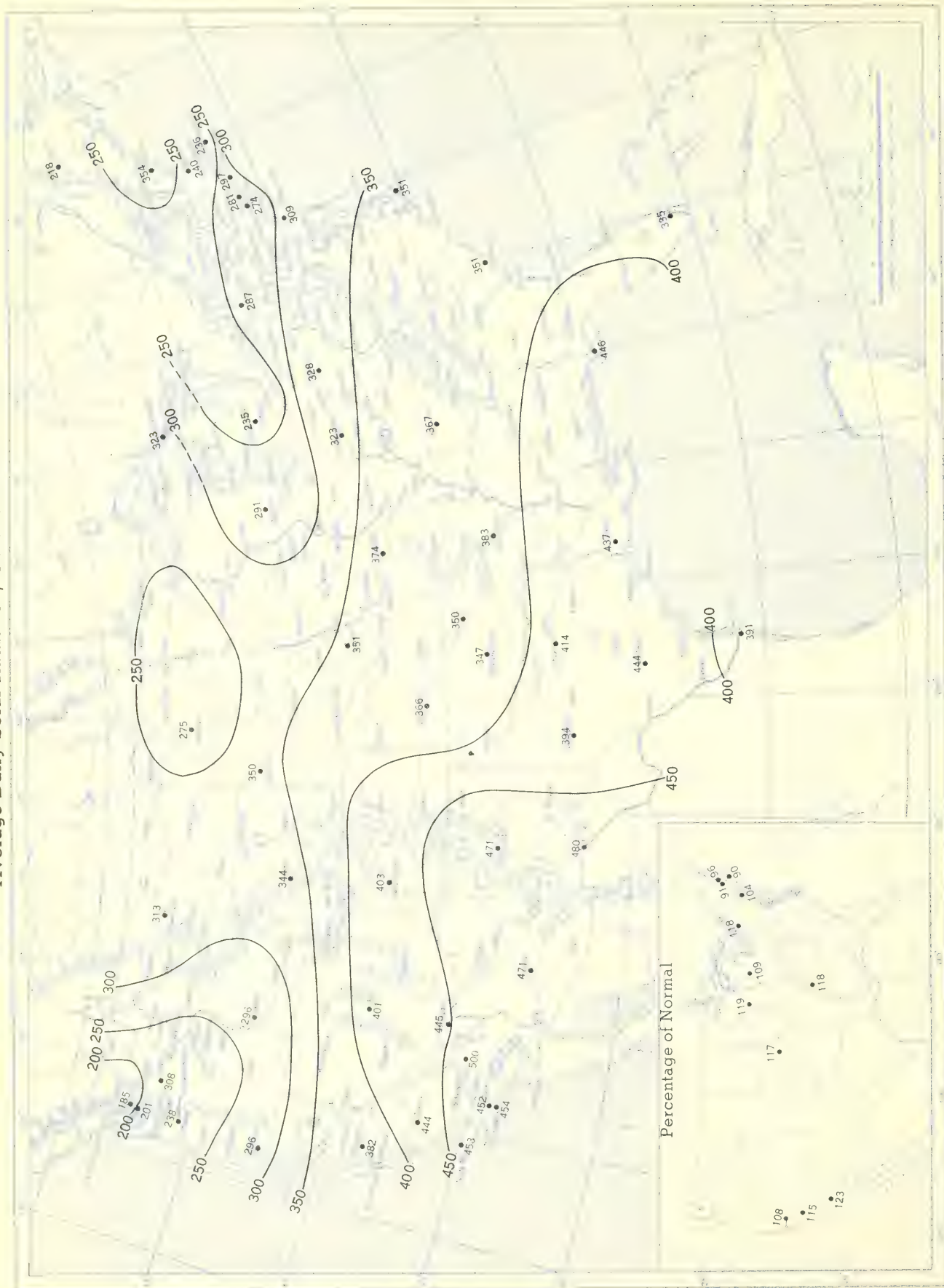


Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.  $^{-2}$ ). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, October 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

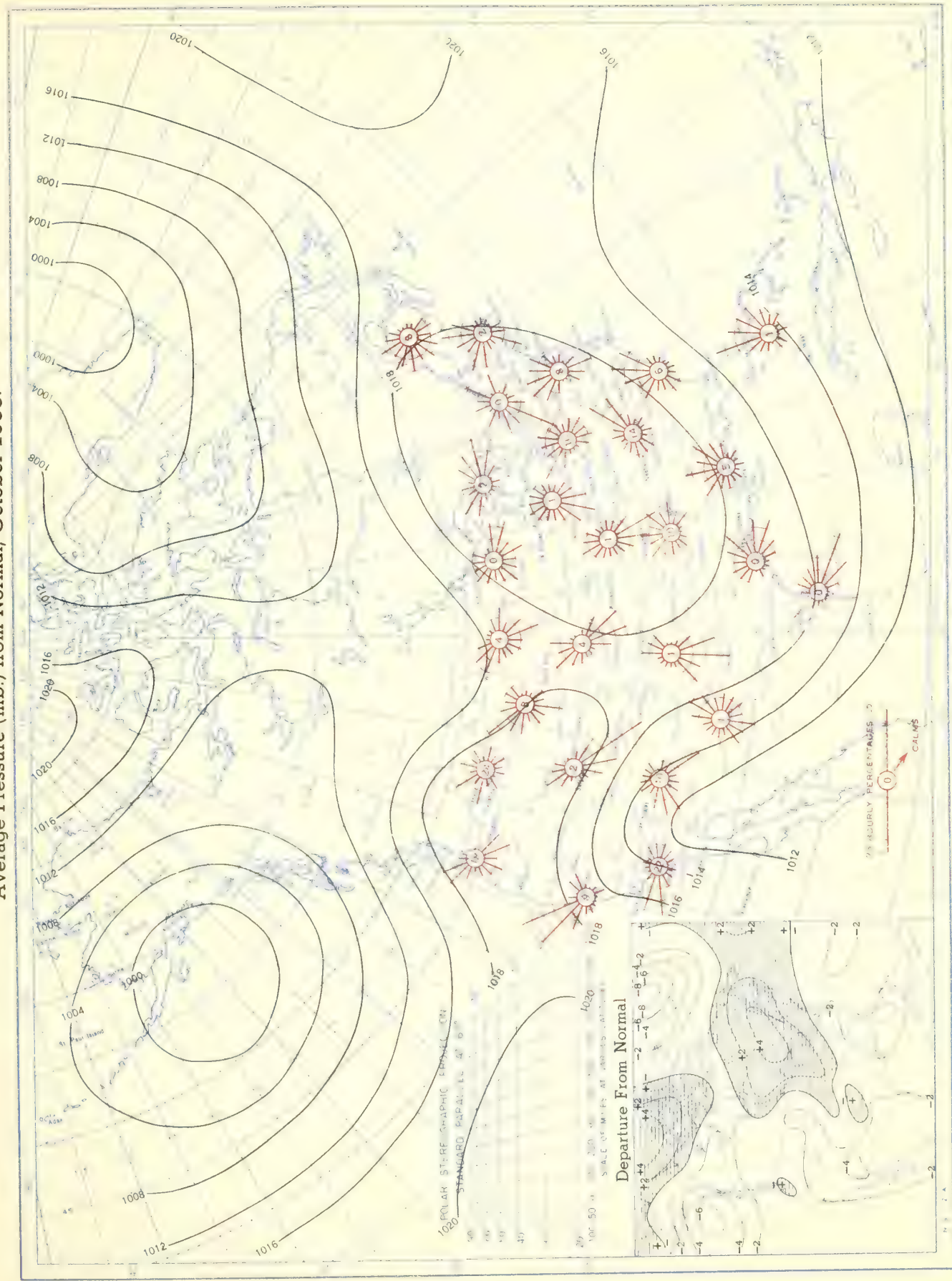


Chart X. Tracks of Centers of Cyclones at Sea Level, October 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

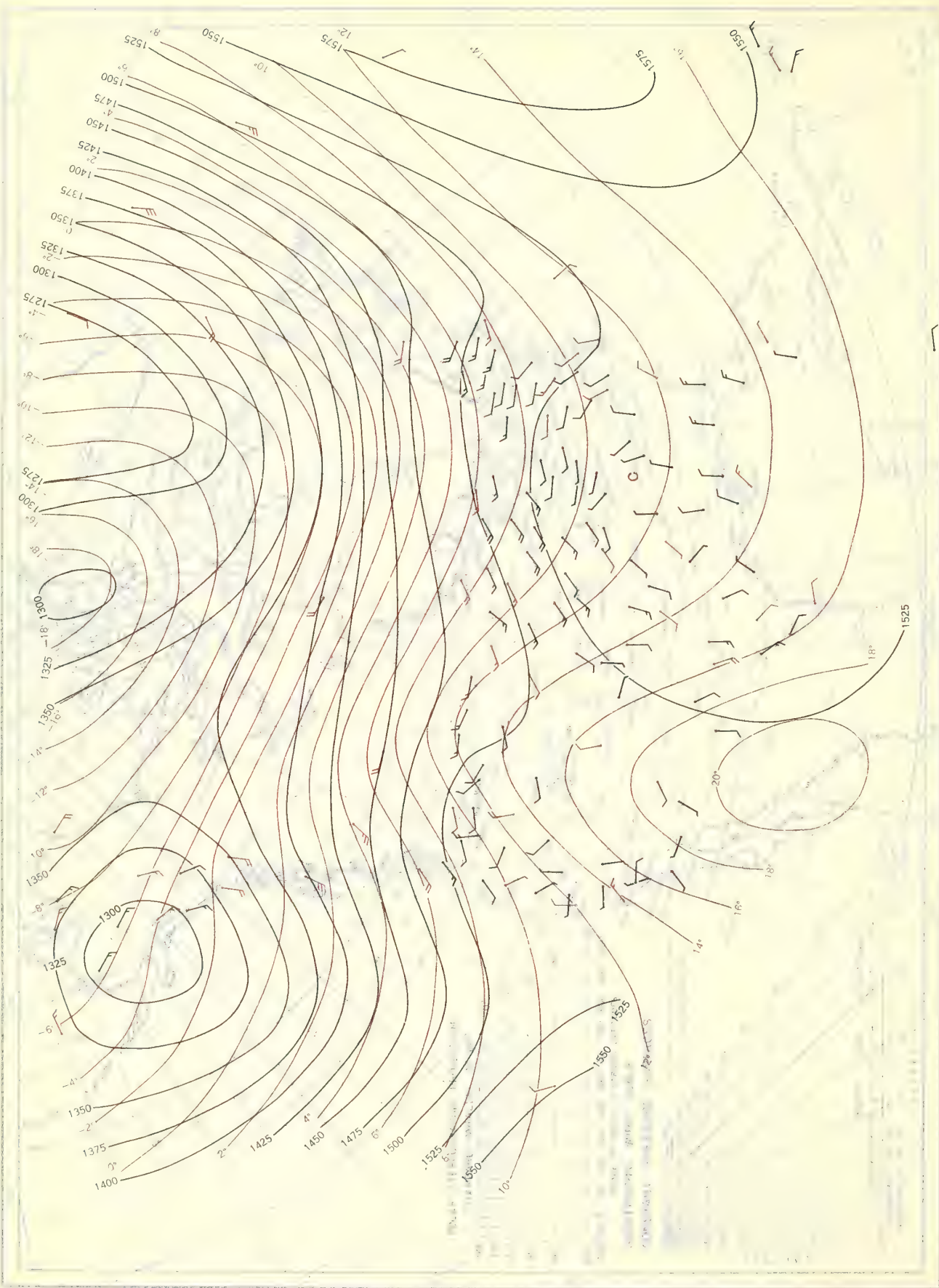
Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, October 1953. Inset: Departure of Average Pressure (mb.) from Normal, October 1953.



Average sea level pressures are obtained from the averages of the 7:30 a.m. and 7:30 p.m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° inter-sections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

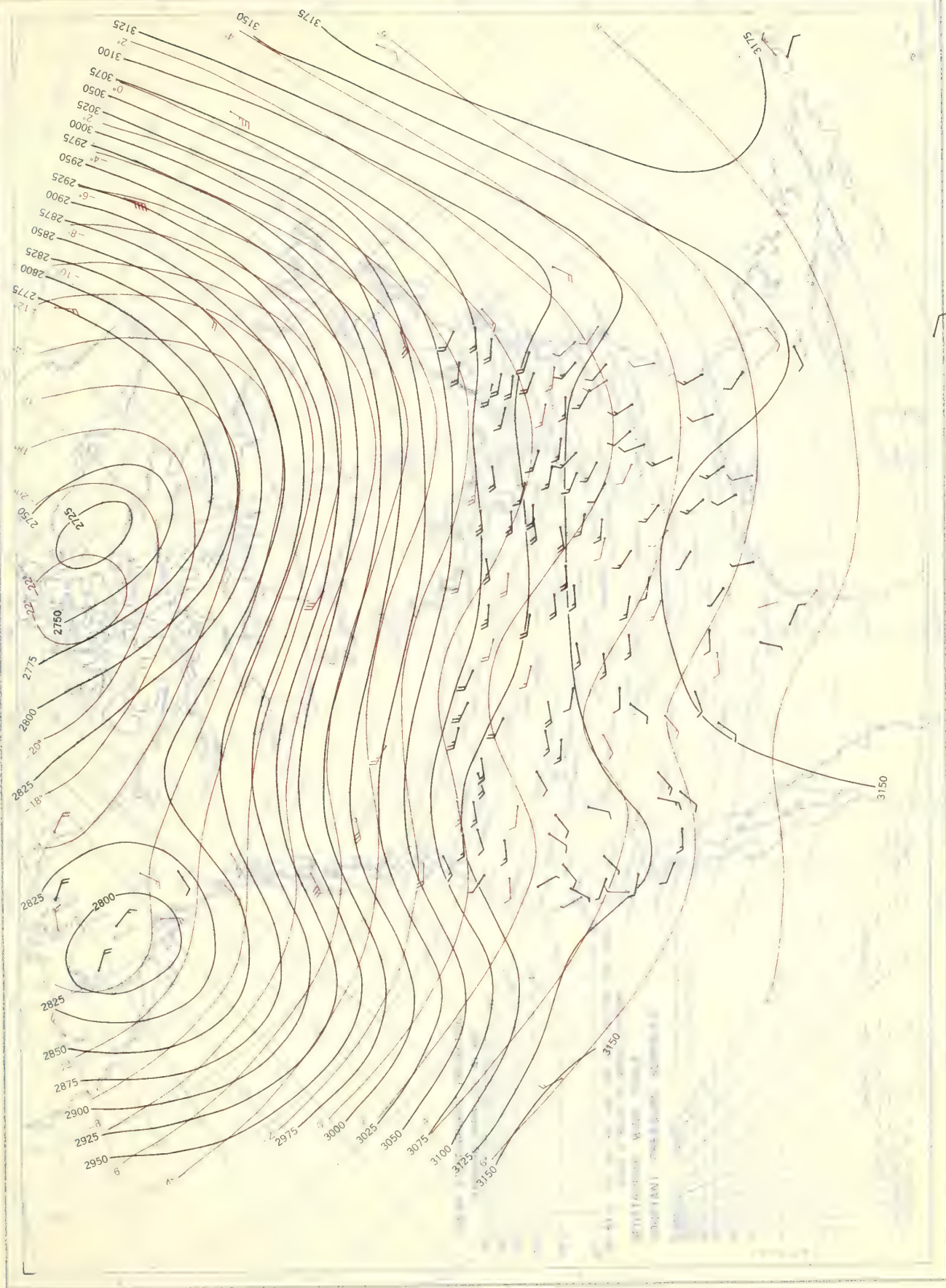


Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), October 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0800 G. M. T.

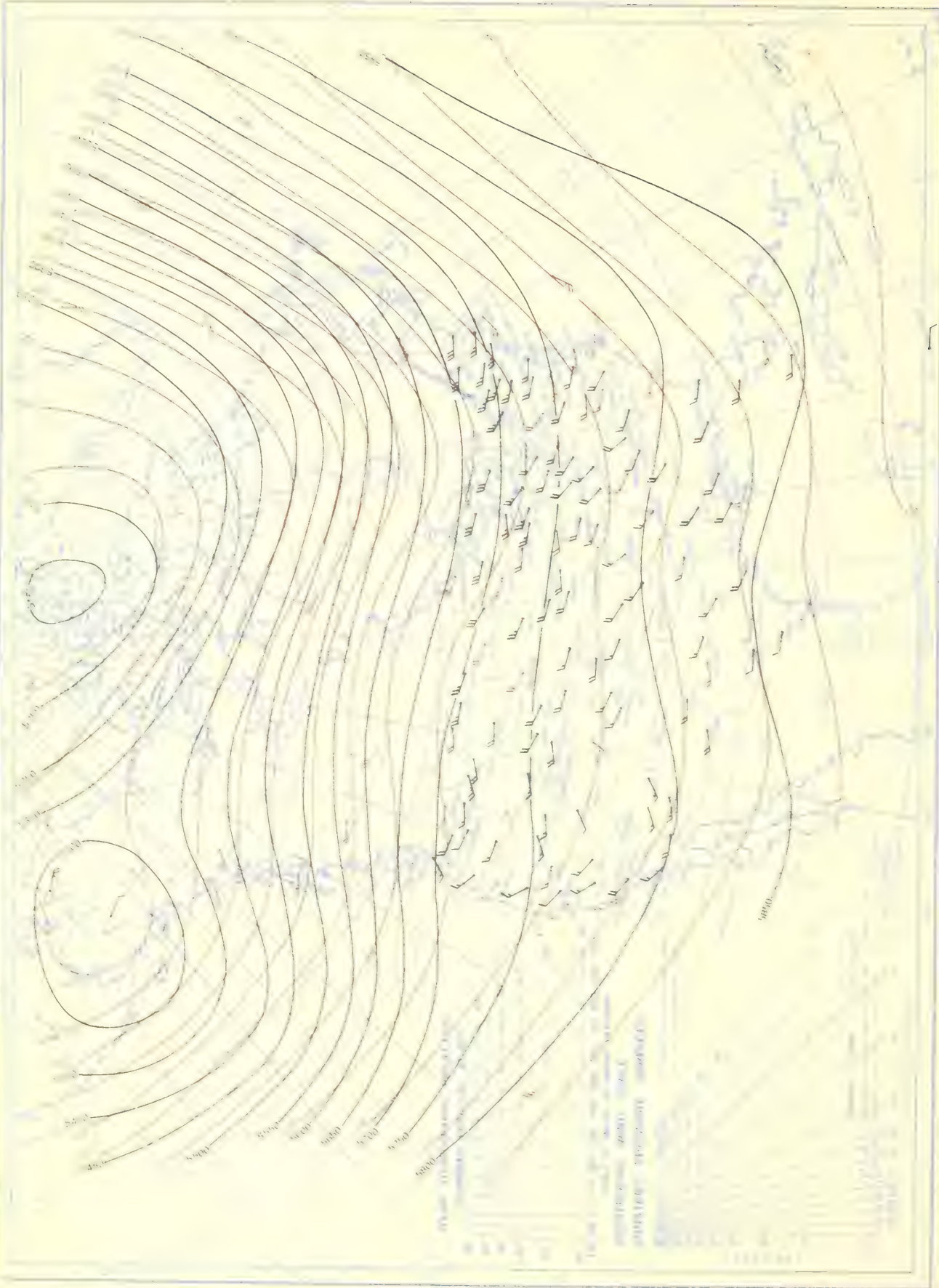
Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), October 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

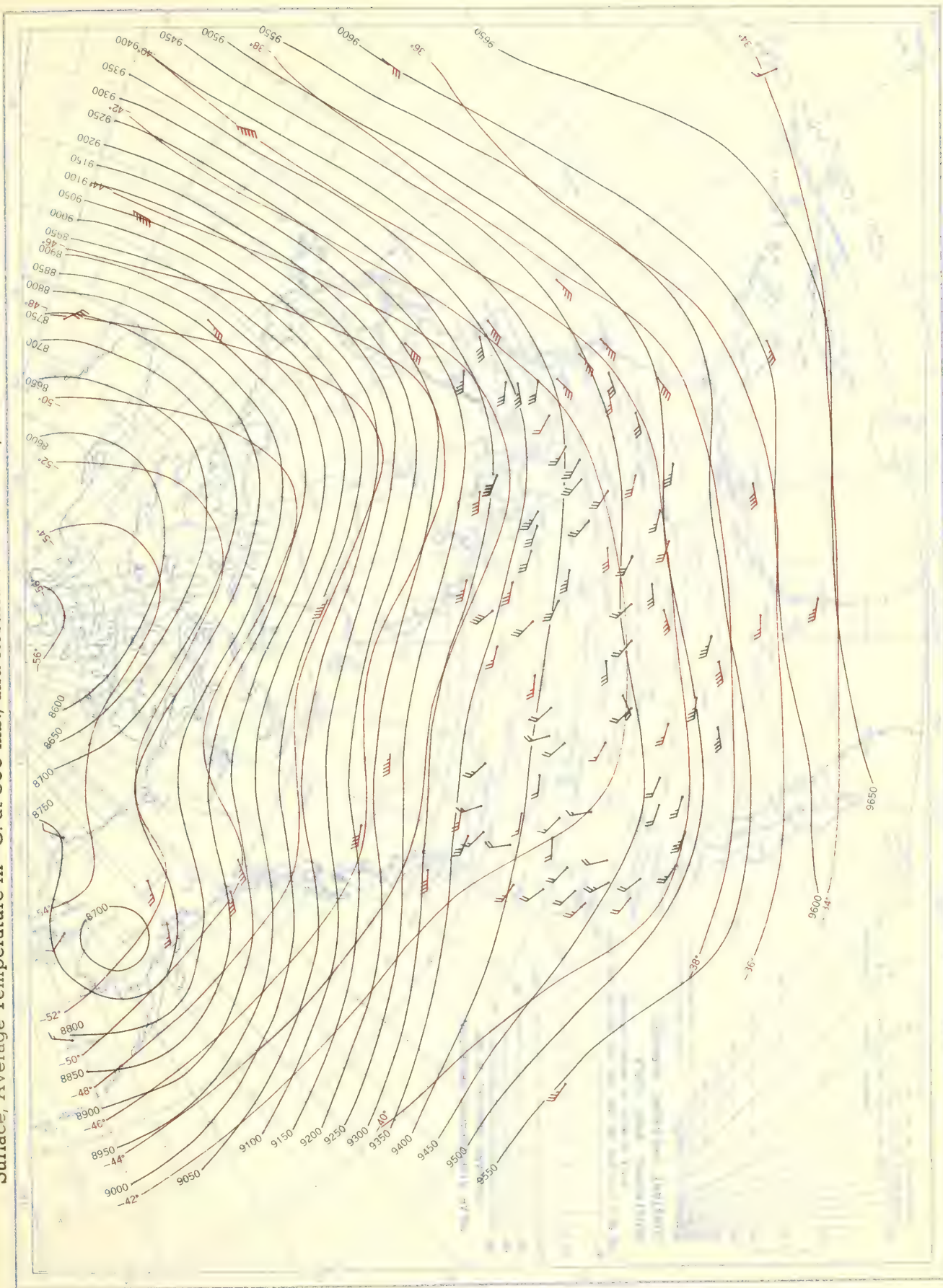


Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in C. at 500 mb., and Resultant Winds (m.s.l.), October 1953



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), October 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.



U. S. Department of Commerce WEATHER BUREAU NWRC - Asheville, N. C.	OFFICIAL BUSINESS Permit No. 1024
---	--------------------------------------

Clemson College  
Clemson  
South Carolina

CD

Penalty for private  
use to avoid pay-  
ment of postage  
\$300.

U. S. DEPARTMENT OF COMMERCE  
SINCLAIR WEEKS, Secretary  
WEATHER BUREAU  
F. W. REICHELDERFER, Chief

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

NOVEMBER 1953

Volume 4 No. 11





# C O N T E N T S

SURFACE DATA	Page
General Summary of Weather Conditions-----	349
Condensed Climatological Data - States-----	351
Climatological Data - Stations-----	352
Heating Degree Days-----	356
Severe Storms-----	357
General Summary of River and Flood Conditions-----	360
Flood Stage Data-----	360

## UPPER AIR DATA

Radiosonde Data-----	361
Pilot Balloon Data-----	364
Rawin Data-----	365

## SOLAR RADIATION DATA

Solar Radiation Intensities-----	366
Blue Hill Data-----	367
Daily Totals and Average Daily Totals by Weeks-----	368
Daily Illumination on a Horizontal Surface-----	370

## CHARTS I-XV

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

SUBSCRIPTION PRICE: Monthly and annual, 15 cents per copy; yearly subscription, including monthly and annual issues, \$1.50. Checks and money orders should be made payable to the "Superintendent of Documents." Remittance and correspondence regarding subscriptions should be sent to "Superintendent of Documents, Government Printing Office, Washington 25, D. C."

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

Volume 4 No. 11

NOVEMBER 1953

### GENERAL SUMMARY OF WEATHER CONDITIONS

Like October 1953, November was warmer, drier, and sunnier than usual in most sections of the Country. The Nationwide temperature average remained above normal and the precipitation average below normal for the sixth consecutive month. Abundant sunshine in most sections east of the Continental Divide established new records for November at St. Louis, Mo., (81% of possible) and El Paso, Tex. (96% of possible), but was much below normal in Washington, Oregon, and most of California. At Sacramento, with 19 cloudy and 10 foggy days, the sun shone only 36% of the time possible, the least since November 1905.

Dry weather continued to delay growth of fall-sown grains in many areas between the Great Plains and the Appalachians until general rains occurred on the 19th and 20th. But these rains only partially relieved water shortages in Missouri and the Ohio Valley where some water hauling for livestock was still necessary at the end of the month. No beneficial rains occurred during the entire month in some sections of the far Southwest. Pastures in southern and western Arizona, Nevada and extreme western Utah remained in poor condition; stock water continued short in southern Nevada; and ground water in southern Nevada and southwestern Utah was at record low levels for November.

Important local weather features during November included: (a) a record snowfall and damaging wind-storm in the middle Atlantic State area on the 6th and 7th, (b) heavy snowfall and near blizzard conditions in the central Great Plains and upper Mississippi Valley on the 20th and 21st, (c) persistent rainy weather in Washington, Oregon, and northern California, with heavy rains and floods in southwestern Oregon and northwestern California on the 22-24th, (d) record late season high temperatures in regions near the Canadian Border east of the Continental Divide during the third week, and (e) occasional heavy fog and haze in many sections of the East from about the 13th through the 21st.

**PRECIPITATION.**--November precipitation was less than 50% of normal in the central Mississippi Valley, the Midwest, southern and western Texas, parts of North Dakota, Montana, and the far Southwest, but in contrast ranged up to 200% of normal or more in the Pacific States, parts of New Mexico, Colorado, Kansas, Nebraska, Florida, central Gulf Coastal sections, and scattered areas along the Atlantic Coast. Despite the scanty precipitation in most of the eastern part of the Country general rain or snow on the 19th and 20th relieved the effects of the fall drought, except for continued water shortages in Missouri and the Ohio Valley.

Rains were frequent and occasionally heavy in the Pacific States. Measurable rain fell at Portland, Ore., on 23 days (only one day short of the November record), at Seattle, Wash., on 24 days, and at Olympia, Wash., on 26 days. Roseburg, Ore., recorded a 24-hour fall of 3.71 inches (a November record) on the 21st-22d, and a 1.35-inch fall in 10 hours at Fresno, Calif., on the 14th exceeded the station's monthly normal. The

heaviest monthly totals in these States ranged up to 26.86 inches at Illahe, Ore., 24.94 at Gasquet Ranger Station in California, and 20.57 inches at Spruce, Wash. On the 21st-24th heavy rains in northwestern California and western Oregon that locally exceeded 8 inches in 24 hours and 12 inches in 72 hours, caused damaging floods in the Umpqua, Coquille, Rogue, Willamette, and Smith Rivers and their principal tributaries. Two lives were lost, highways were damaged, a considerable number of livestock were drowned, and several homes were destroyed. Total flood damage in Oregon was estimated at more than \$1,000,000.

Much of the precipitation in Kansas and Nebraska occurred during snowstorms on the 4th-7th and 19th-20th. In south-central Nebraska some stations reported the wettest November on record. Monthly totals (water) ranged up to 4.01 inches at Lebanon, Kans., and 4.62 inches at Crete, Nebr.

Heavy rainfall for the month in the Gulf and Atlantic coastal areas ranged up to 12.46 inches at New Orleans, La.; 10.81 at Long Key, Fla.; and 8.64 inches at Newton, Mass. New Orleans, La., recorded 7.77 inches in 24 hours (a November record) on the 19-20th, and Providence, R. I., recorded 3.71 inches in 24 hours (a November record) on the 22-23d.

**SNOWFALL.**--Snowfall this month was unseasonably heavy in two areas. One included southern New England and the Middle Atlantic States and extended southward to North Carolina and westward through Ohio and most of Indiana and Illinois; the other was the central and lower Rocky Mountain regions, most of Kansas, Nebraska, South Dakota, and west-central and northern Minnesota.

The heavy snowfall in the Northeast occurred on the 6th and 7th as a severe storm moved up the Atlantic Coast to southeastern New York and thence northwestward across that State. At many stations between the Appalachians and the coast this was the heaviest early season snowstorm on record. Among the many stations reporting record early-season falls were: Harrisburg, Pa., 15.4 inches (also a record total for November and the fourth heaviest total for any month); Wilmington, Del., 11.9; Reading, Pa., 11.5; Washington, D. C., 6.5; Baltimore, Md., 5.9; New York City, 3.7; and 0.2 inch at Raleigh, N. C., which was the earliest measurable snowfall there on record. The greatest storm total reported was 27.5 inches at Middleburg, Pa., and more than 2 feet were reported locally in western New York State.

Most of the snow in the Rocky Mountains and Great Plains fell during storms on the 4-7th and 18-21st. During the first storm the heaviest fall occurred in south-central Nebraska and north-central Kansas where total falls of 15 inches and depths up to 10 inches were reported. During the second storm 11 inches fell at Lander, Wyo., and 4 to 8 inches were reported in Arizona at elevations above 7,000 feet. In east-central South Dakota and southern Minnesota where heavy snowfalls and high winds were preceded by glaze



# GENERAL SUMMARY OF WEATHER CONDITIONS—Continued

NOVEMBER 1953

and sleet, power and communication lines suffered considerable damage. Some stations in western Kansas reported the greatest November totals in 50 years. For Albuquerque, N. Mex., 7.5 inches (all of which fell from the 18th through the 21st) was the second heaviest November snowfall on record.

From the eastern Dakotas eastward through the Great Lakes Region and in scattered sections of surrounding areas light to moderate snow, which fell during the last week, remained on the ground until the end of the month. Depths ranged up to 5 inches in the eastern Dakotas, north-central Minnesota, and northern Indiana.

Snowfall in the Pacific States generally was below normal except at a few scattered stations in the Sierra Nevadas, where the greatest monthly total reported was 30.5 inches at Soda Springs, Calif.

**TEMPERATURE.**--Average monthly temperature departures generally ranged from 6° to 10° above normal in regions near the Canadian Border where this November was one of the warmest on record, but tapered off in southern regions to about 2° to 4° above normal in the Southwest and to normal or slightly below in south-central and south-eastern areas.

In most of the Country highest temperatures occurred on the first 3 days when temperatures were unseasonably high over nearly the entire Nation, or during the second decade when unseasonably warm weather spread from the far West to the Atlantic Coast. During the latter period maximum temperatures in northern regions rose to record-breaking levels for so late in the season. Among these new records were Roseburg, Ore., with 73° on the 13th; Minneapolis, Minn., with 71° on the 17th; Lansing, Mich., with 70° on the 19th; and Buffalo, N. Y., with 72° on the 20th.

There were two main periods of cool weather. During the first period, 4-11th, all sections east of the Rocky Mountains experienced from 4 to 8 days of below normal temperatures, subzero temperatures occurred at a few north-central stations, and the frost line was extended deep into southern Texas and the central Gulf States. Cold weather during the second period first affected the far West on the 18th and 19th and moved eastward reaching the Atlantic Coast on the 28th. Subzero

minima occurred at higher elevations in the Rocky Mountains on the 20th and 21st, and minima fell to record low levels for the season in Arizona where killing frost occurred in the southern valleys at elevations as low as 1,500 feet. On the 27th freezing occurred in the Southeast to northern Florida (Tallahassee 32°) and scattered frosts were reported southward to the Everglades. In the western half of the Country lowest temperatures were recorded from the 18th to the 22d except in Washington and northern portions of Oregon and Idaho where they occurred on the 2d or 3d. In the eastern half of the Country, temperatures in Michigan and the Northeast were lowest on the 6th, at many stations in the east-central Great Plains on the 8th or 9th, in eastern Texas, Arkansas and the central Gulf States on the 9th, 10th, or 11th, and at the remaining eastern stations after the 26th.

Extreme temperatures for the month ranged from 99° at Indio Date Garden, Calif., on the 1st to -19° at Monte Vista, Colo., on the 20th.

**DESTRUCTIVE STORMS.**--The greater part of the month's storm losses occurred in the Northeast on the 6th and 7th when an Atlantic storm moved inland across New York State. Gale winds during the storm with gusts of hurricane force (98 m.p.h. at Block Island, R. I.) heavily damaged power and communication lines. The high winds occurred at high tide and waves caused an additional damage to boats and shore installations. Losses were estimated at \$2,000,000 in New England and \$6,000,000 in New Jersey. In New York losses were placed at \$675,000 for the southern shore of Staten Island and \$1,000,000 in the Borough of Queens; additional heavy damage in other coastal sections of this State (not yet estimated) are expected to total several million dollars.

In the central and northern Great Plains winter-type storms of wind, snow, sleet, and glaze caused over a half million dollars damage. Of this total, \$50,000 resulted from wind and glaze, in east-central Colorado on the 5th, \$225,000 was caused by glaze and snow in eastern South Dakota on the 29th, and \$300,000 resulted from glaze, sleet, snow, and wind in southwestern Colorado on the 20th and 21st.

An outbreak of tornadoes in south-central Louisiana on the 21st caused over \$250,000 damage.

# CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

NOVEMBER 1953

Section	Temperature								Precipitation							
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes					
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least		
	*F.	*F.		*F.			*F.		In.	In.		In.		In.		
Alabama	52.9	-1.3	Dayton	86	4	Valley Head	17	28	2.55	-0.86	Robertsdale 7E	9.17	Russellville 2	0.29		
Arizona	52.1	+2.3	4 Stations	94	02	Maverick	-10	22	4.40	-0.31	Flagstaff WB AP	1.83	14 Stations	0.00		
Arkansas	49.5	-1.7	Fordyce	85	10	Nammoth Springs	15	28	2.16	-1.64	Dermott	4.56	Siloam Springs	.82		
California	53.4	+1.4	Indio US Date Garden	99	1	Big Bear Lake Dam	1	21	2.66	+0.35	Gasquet RS	24.94	5 Stations	.00		
Colorado	37.9	+3.0	Uteville	82	28	Monte Vista	-19	20	1.12	+0.29	Wolf Creek Pass 4W	4.60	Parker 9E	.20		
Connecticut	43.7	+2.7	4 Stations	73	03	Falls Village	16	27	3.55	-.28	Pachaug St. Forest	7.00	Rocky River Dam	1.93		
Delaware	46.6	-1.1	do	76	03	Newark College Farm	14	8	2.73	-.26	Willsboro	4.35	Bridgeville	1.17		
Florida	65.1	+1.1	Tamiami Trail	91	22	Niceville	29	29	3.57	+1.34	Longboat Key	10.81	Lake Trafford	.25		
Georgia	54.1	-1.1	Swainsboro	87	3	Blairsville Exp. Sta.	14	10	1.58	-1.07	Tray Mt.	5.20	Lexington	.29		
Idaho	40.0	+4.7	40 Mi. Bend	74	16	3 Stations	-6	19	1.65	-0.32	Burke 2NNE	6.91	Arco	T		
Illinois	44.6	+2.4	Harrisburg	79	2	Aurora College	5	28	.90	-1.72	Galena	1.87	Golden	.35		
Indiana	43.9	+1.7	Mt. Vernon Wtr. Wks.	80	3	Collegeville St. Jos. C	7	28	1.45	-1.57	Crane Naval Depot	2.79	2 Stations	.60		
Iowa	41.4	+4.0	3 Stations	80	02	Carroll 25SW	3	5	1.33	-.39	Logan	2.52	do	.25		
Kansas	44.6	+0.8	2 Stations	82	2	3 Stations	3	22	2.06	+0.67	Lebanon	4.01	Preston 5N	.78		
Kentucky	45.5	-.8	5 Stations	80	3	West Liberty Wtr. Wks.	7	7	1.48	-2.00	Munfordville	2.60	Campbellsville	.37		
Louisiana	56.5	-1.8	Arcadia	87	15	Tallulah Delta Lab.	17	10	4.62	+0.73	New Orleans London	12.46	Tallulah Delta Lab.	1.23		
Maine	40.4	+5.2	4 Stations	73	20	Rumford 3SW	10	6	4.10	+0.48	Bar Harbor	5.93	Jackman	2.28		
Maryland	46.1	+0.8	Unionville	83	3	Oakland	13	11	2.02	-.73	Berlin 2NE	3.54	Luke	.69		
Massachusetts	44.8	+3.8	3 Stations	76	019	Birch Hill Dam	10	27	5.02	+1.32	Newton	8.64	South Egremont	1.75		
Michigan	40.8	+4.8	2 Stations	74	016	Ironwood	-3	28	1.53	-.99	Houghton CAA AP	3.72	Dearborn	.44		
Minnesota	35.8	+6.4	Madison	76	15	Cloquet Forest Exp. St.	-2	26	1.50	+0.32	Wheaton	2.56	Caribou 2S	.10		
Mississippi	53.7	-1.3	Eupora	91	3	4 Stations	18	09	2.56	-1.25	Picayune	10.19	Smithville	.03		
Missouri	46.5	+1.9	2 Stations	81	3	2 Stations	9	28	1.01	-1.72	Koshkonong	2.33	Brunswick	.16		
Montana	38.1	+6.2	do	78	01	Lakeview	-14	19	.52	-.26	Trout Creek 2W	5.04	5 Stations	.00		
Nebraska	40.3	+3.1	Niobrara	85	15	Broken Bow 2W	-1	22	1.63	+0.86	Crete	4.62	2 Stations	.13		
Nevada	44.0	+3.4	Overton	85	1	Gibbs Ranch	-4	19	.29	-.35	Arthur	1.43	4 Stations	.00		
New Hampshire	40.6	+5.1	2 Stations	76	20	Fabyan	2	6	3.17	-.21	New Castle	5.39	Lancaster	.98		
New Jersey	45.4	+1.4	Canoe Brook	78	21	Canoe Brook	14	27	2.94	-.47	Pleasantville 1N	8.55	Swedesboro 5NW	1.30		
New Mexico	44.5	+1.5	4 Stations	82	01	Gavilan	-15	22	.61	+0.07	Lake Maloya	3.58	10 Stations	.00		
New York	41.7	+4.1	2 Stations	76	3	Speculator	0	6	2.17	-.90	Orient 2E	7.14	Lawrenceville	.44		
North Carolina	50.0	-0.5	Gastonia	85	3	Celo 2S	5	29	2.49	-.30	Lola	7.46	Reidsville	.23		
North Dakota	35.4	+8.0	2 Stations	75	015	Linton	-6	22	.36	-.25	Wahpeton St. School	1.51	5 Stations	T		
Ohio	43.6	+2.0	do	79	03	3 Stations	8	29	1.22	-1.49	Geneva 3SW	4.19	Mt. Healthy Exp. Farm	.28		
Oklahoma	50.1	+2.0	do	83	02	Beaver	6	22	1.65	-.38	El Reno	6.61	Reydon	.13		
Oregon	44.2	+4.0	Modoc Orchard	75	0	Seneca	0	021	5.35	+1.48	Ilwaco 1N	26.86	Mitchell	E.24		
Pennsylvania	42.6	+1.2	2 Stations	79	017	Claysville 3W	8	29	2.21	-.79	Lock Haven	4.83	Connellsville	.49		
Rhode Island	46.1	+2.9	Providence WB AP	73	18	Kingston	24	013	6.23	+2.43	Austin	7.45	Kingston	6.02		
South Carolina	53.1	-.7	2 Stations	85	03	Union 7SW	15	29	1.63	-.70	Myrtle Beach CAA AP	5.49	Edgefield	.22		
South Dakota	38.8	+5.7	Winner	84	14	Pollock	-6	22	.71	+0.05	Armour	1.91	Hot Springs 9SW	.08		
Tennessee	47.4	-1.0	Murfreesboro	81	3	Columbia 1WSW	11	28	1.47	-2.20	Memphis WB AP	4.00	Chapel Hill	.30		
Texas	54.6	-1.1	2 Stations	92	010	Stratford	7	22	1.13	-.71	William Harris Res.	9.64	Several	.00		
Utah	41.5	+4.4	St. George PH	82	012	Vernal AP	-16	21	.83	-.10	Alta	6.09	4 Stations	.00		
Vermont	40.4	+5.4	Vernon	76	4	Lemington	6	6	1.94	-1.25	McIndoe Falls	2.60	Essex Junction	1.33		
Virginia	46.9	+1.3	3 Stations	82	3	Burkes Garden	2	29	1.47	-1.11	Surry 3S	4.11	Philpot Dam 2	.44		
Washington	42.6	+2.7	Colfax 1NW	75	10	Harrington 1N	10	2	4.86	+0.18	Spruce	20.57	Othello 5E	.46		
West Virginia	42.2	-1.0	2 Stations	80	22	Cranberry Glades	-9	29	1.23	-1.50	Berkeley Springs	2.57	Princeton	.46		
Wisconsin	38.5	+5.5	3 Stations	75	02	Long Lake Dam	-7	28	1.44	-.45	Gurney	3.18	Oshkosh	.21		
Wyoming	36.7	+5.4	2 Stations	79	01	2 Stations	-16	21	.71	-.09	Snake River	3.41	Hampshire 3SW	.00		
Puerto Rico	76.9	+0.8	Dos Bocas (2)	95	03	Garzas Dam	50	12	5.13	-1.87	Salto Garzas	13.51	Calero Camp (2)	.75		

° Other dates also.

E Water equivalent of snowfall wholly or partly estimated, using a ratio of 1 inch of water equivalent to every 10 inches of new snowfall.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See individual Climatological Data for times of observations).



## CLIMATOLOGICAL DATA

Table 2

NOVEMBER 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation										Wind			No. of days																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal			Date	Lowest	Date	No. of days		Average dew point	Average relative humidity	Precipitation			Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		to sunset																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
							Highest	Date	Total				Departure from normal	Greatest in 24 hours			No. of days	Snow, Sleet, Hail	Max depth on ground	Speed	Direction			Clear	Partly cloudy	Cloudy																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
																											Max. 90° F or above	Min. 32° F or below	In.	In.	In.	0.1 inch or more	With thunderstorms	Total	Max depth on ground	M	M	0-3	4-7	8-10																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	ft	mb	mb	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	In.	In.	In.	0.1 inch or more	With thunderstorms	Total	Max depth on ground	M	M	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F

## CLIMATOLOGICAL DATA

Table 2-Continued

NOVEMBER 1953

State and station	Elevation (ground)	Pressure			Temperature										Precipitation										Wind		No of days																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal				No of days	Max 90° F or above	Min 32° F or below	Average dew point	Average relative humidity				Departure from normal	No of days			Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		(sunrise to sunset)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
							Highest	Date	Lowest	Date					Total	Departure from normal	Greatest in 24 hours	0.1 inch or more		With thunderstorms	Total	Max depth on ground	Speed	Direction			Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
																																	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F

See footnotes at end of table.



## CLIMATOLOGICAL DATA

Table 2—Continued

NOVEMBER 1953

State and station	Elevation (ground)	Pressure		Temperature										Precipitation										Wind				No. of days (sunrise to sunset)																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
		Station	Sea level	Average			Departure from normal			Highest	Date	Lowest	Date	No. of days		Average dew point	Average relative humidity		Total	Departure from normal		Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile		(sunrise to sunset)																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
				Average maximum	Average minimum	Average	°F	°F	°F					°F	°F		°F	°F		°F	°F		°F	°F	%	In.			In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.

## CLIMATOLOGICAL DATA

Table 2—Continued

NOVEMBER 1953

State and station	Elevation (ground) Fe	Pressure		Temperature										Precipitation					Wind				No. of days (sunrise to sunset)											
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max 90° F or above	No. of days Min 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days 1.0 inch or more	With thunderstorms	Snow, Sleet, Hail	Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine		
TEXAS	Abilene	1752	957.7	1019.6	64	42	53.2	-0.5	79	18	29	9	0	2	40	66	0.39	-0.63	0.30	4	1	T	0	9.8	S	31	SE	6	15	5	10	4.5	65	
Amarillo	3590	891.0	1018.3	61	35	47.9	+2.7	77	26	20	21	0	8	34	65	0.56	-0.32	0.39	5	1	T	0	10.7 <th>SW<th>40</th><th>SE<th>6<th>18<th>6<th>6<th>3.7<th>75</th></th></th></th></th></th></th></th>	SW <th>40</th> <th>SE<th>6<th>18<th>6<th>6<th>3.7<th>75</th></th></th></th></th></th></th>	40	SE <th>6<th>18<th>6<th>6<th>3.7<th>75</th></th></th></th></th></th>	6 <th>18<th>6<th>6<th>3.7<th>75</th></th></th></th></th>	18 <th>6<th>6<th>3.7<th>75</th></th></th></th>	6 <th>6<th>3.7<th>75</th></th></th>	6 <th>3.7<th>75</th></th>	3.7 <th>75</th>	75		
Austin	615	998.6	1020.8	68	46	57.2	-2.0	79	18	34	9	0	0	46	71	0.38	-1.97	0.99	5	0	T	0	8.0	NE	30	N	24 <th>14<th>6<th>10<th>4.6</th><th>68</th></th></th></th>	14 <th>6<th>10<th>4.6</th><th>68</th></th></th>	6 <th>10<th>4.6</th><th>68</th></th>	10 <th>4.6</th> <th>68</th>	4.6	68		
Brownsville	16	1016.6	1019.0	77	58	67.5	-3.3	87	19	44	9	0	0	57	74	0.38	-1.17	0.33	5	1	0	0	10.1	SE	30	NW	24 <th>12<th>7<th>11<th>4.8</th><th>60</th></th></th></th>	12 <th>7<th>11<th>4.8</th><th>60</th></th></th>	7 <th>11<th>4.8</th><th>60</th></th>	11 <th>4.8</th> <th>60</th>	4.8	60		
Corpus Christi	40	1019.0	1020.0	75	56	65.0	+7.0	90	19	43	9	1	0	56	76	0.69	-1.05	0.48	4	0	0	0	10.7	N	29	N	7 <th>13<th>7<th>10<th>4.6</th><th>68</th></th></th></th>	13 <th>7<th>10<th>4.6</th><th>68</th></th></th>	7 <th>10<th>4.6</th><th>68</th></th>	10 <th>4.6</th> <th>68</th>	4.6	68		
Dallas	487	1002.4	1021.2	65	44	54.5	-1.3	76	18	32	9	0	1	44	70	2.77	+3.34	1.94	5	2	T	0	6.6	SE	31	SW	26 <th>13<th>5<th>12<th>5.2</th><th>53</th></th></th></th>	13 <th>5<th>12<th>5.2</th><th>53</th></th></th>	5 <th>12<th>5.2</th><th>53</th></th>	12 <th>5.2</th> <th>53</th>	5.2	53		
Del Rio	1091	985.1	1019.7	72	46	59.0	-1.2	81	18	35	22	0	0	42	60	T	-0.80	T	0	0	0	0	5.7	ESE	28	N	21 <th>18<th>6<th>6<th>3.5<th>70</th></th></th></th></th>	18 <th>6<th>6<th>3.5<th>70</th></th></th></th>	6 <th>6<th>3.5<th>70</th></th></th>	6 <th>3.5<th>70</th></th>	3.5 <th>70</th>	70		
El Paso	3920	888.9	1017.9	68	40	53.8	+1.8	76	4	27	20	0	4	26	37	T	-0.38	T	0	0	0	0	10.2	NNE	50	NW	20 <th>22<th>6<th>2<th>2.1</th><th>96</th></th></th></th>	22 <th>6<th>2<th>2.1</th><th>96</th></th></th>	6 <th>2<th>2.1</th><th>96</th></th>	2 <th>2.1</th> <th>96</th>	2.1	96		
Fort Worth	544	1000.0	1021.4	64	44	53.7	-2.1	75	18	35	9	0	0	40	64	2.09	-1.15	1.49	5	1	T	0	10.0	S <th>34</th> <th>W</th> <th>19<th>14<th>4<th>12<th>4.9</th><th>57</th></th></th></th></th>	34	W	19 <th>14<th>4<th>12<th>4.9</th><th>57</th></th></th></th>	14 <th>4<th>12<th>4.9</th><th>57</th></th></th>	4 <th>12<th>4.9</th><th>57</th></th>	12 <th>4.9</th> <th>57</th>	4.9	57		
Tatoosh CO	7	---	---	67	56	61.5	-2.1	74	27	44	9	0	0	55	80	5.30	+1.46	3.50	7	1	0	0	12.3 <th>N<th>31<th>N</th><th>8<td>11</td><td>11</td><td>11</td><td>4.5</td><th>57</th></th></th></th>	N <th>31<th>N</th><th>8<td>11</td><td>11</td><td>11</td><td>4.5</td><th>57</th></th></th>	31 <th>N</th> <th>8<td>11</td><td>11</td><td>11</td><td>4.5</td><th>57</th></th>	N	8 <td>11</td> <td>11</td> <td>11</td> <td>4.5</td> <th>57</th>	11	11	11	4.5	57		
Galveston	5	1020.0	1020.5	68	55	61.4	-2.0	75	18	44	9	0	0	55	80	4.68	-0.49	2.25	8	4	0	0	13.0	NNE <th>35<th>N</th><th>16<th>11<td>13</td><td>13</td><td>4.6</td></th><th>57</th></th></th>	35 <th>N</th> <th>16<th>11<td>13</td><td>13</td><td>4.6</td></th><th>57</th></th>	N	16 <th>11<td>13</td><td>13</td><td>4.6</td></th> <th>57</th>	11 <td>13</td> <td>13</td> <td>4.6</td>	13	13	4.6	57		
Houston CO	41	1015.6	1019.6	70	52	60.7	-1.2	79	27	41	10	0	0	47	70	5.11	+1.16	3.36	6	2	0	0	9.8 <th>---<th>30</th><th>N</th><th>24<th>12<th>8<th>10<th>4.9<th>63</th></th></th></th></th></th></th>	--- <th>30</th> <th>N</th> <th>24<th>12<th>8<th>10<th>4.9<th>63</th></th></th></th></th></th>	30	N	24 <th>12<th>8<th>10<th>4.9<th>63</th></th></th></th></th>	12 <th>8<th>10<th>4.9<th>63</th></th></th></th>	8 <th>10<th>4.9<th>63</th></th></th>	10 <th>4.9<th>63</th></th>	4.9 <th>63</th>	63		
Houston	50	1018.0	1020.9	70	50	60.0	-0.9	80	27	38	9	0	0	47	70	5.27	+1.09	3.18	6	1	0	0	14.2	ENE	--- <th>---<th>15<th>14<th>11<th>4<th>4.6</th><th>57</th></th></th></th></th></th>	--- <th>15<th>14<th>11<th>4<th>4.6</th><th>57</th></th></th></th></th>	15 <th>14<th>11<th>4<th>4.6</th><th>57</th></th></th></th>	14 <th>11<th>4<th>4.6</th><th>57</th></th></th>	11 <th>4<th>4.6</th><th>57</th></th>	4 <th>4.6</th> <th>57</th>	4.6	57		
Laredo	500	1004.1	1019.2	76	53	64.4	-1.6	90	19	40	9	1	0	50	64	T	-0.97	T	0	0	0	0	10.6 <th>SE<th>28</th><th>NE<th>7<th>13<th>8<th>9<th>4.7</th><th>57</th></th></th></th></th></th></th>	SE <th>28</th> <th>NE<th>7<th>13<th>8<th>9<th>4.7</th><th>57</th></th></th></th></th></th>	28	NE <th>7<th>13<th>8<th>9<th>4.7</th><th>57</th></th></th></th></th>	7 <th>13<th>8<th>9<th>4.7</th><th>57</th></th></th></th>	13 <th>8<th>9<th>4.7</th><th>57</th></th></th>	8 <th>9<th>4.7</th><th>57</th></th>	9 <th>4.7</th> <th>57</th>	4.7	57		
Lubbock	3243	905.9	1018.6	63	35	49.1	+5.5	77	26	20	22	0	9	36	66	0.16	-0.47	0.11	4	0	0	0	12.5	WSW <th>40</th> <th>WSW<th>21<th>18<th>8<th>4<th>3.3</th><th>57</th></th></th></th></th></th>	40	WSW <th>21<th>18<th>8<th>4<th>3.3</th><th>57</th></th></th></th></th>	21 <th>18<th>8<th>4<th>3.3</th><th>57</th></th></th></th>	18 <th>8<th>4<th>3.3</th><th>57</th></th></th>	8 <th>4<th>3.3</th><th>57</th></th>	4 <th>3.3</th> <th>57</th>	3.3	57		
Midland	2854	919.7	1018.7	67	40	53.5	---	76	17	25	22	0	3	37	59	T	---	T	0	1	0	0	6.5	SSE <th>33</th> <th>SSE<th>19<th>18<th>7<th>5<th>3.0</th><th>57</th></th></th></th></th></th>	33	SSE <th>19<th>18<th>7<th>5<th>3.0</th><th>57</th></th></th></th></th>	19 <th>18<th>7<th>5<th>3.0</th><th>57</th></th></th></th>	18 <th>7<th>5<th>3.0</th><th>57</th></th></th>	7 <th>5<th>3.0</th><th>57</th></th>	5 <th>3.0</th> <th>57</th>	3.0	57		
Port Arthur	16	1019.3	1020.6	69	48	58.2	-1.1	78	2	35	10	0	0	49	75	4.84	+1.28	1.42	9	3	T	0	11.1	NNE <th>34</th> <th>SE<th>21<th>16<th>3<th>11<th>4.8</th><th>58</th></th></th></th></th></th>	34	SE <th>21<th>16<th>3<th>11<th>4.8</th><th>58</th></th></th></th></th>	21 <th>16<th>3<th>11<th>4.8</th><th>58</th></th></th></th>	16 <th>3<th>11<th>4.8</th><th>58</th></th></th>	3 <th>11<th>4.8</th><th>58</th></th>	11 <th>4.8</th> <th>58</th>	4.8	58		
San Angelo	1903	951.9	1019.9	66	43	54.6	-1.8	78	18	28	22	0	3	40	60	0.06	-1.03	0.62	1	1	T	0	--- <th>---<th>---<th>---<th>15<th>6<th>9<th>3<th>3.8</th><th>57</th></th></th></th></th></th></th></th>	--- <th>---<th>---<th>15<th>6<th>9<th>3<th>3.8</th><th>57</th></th></th></th></th></th></th>	--- <th>---<th>15<th>6<th>9<th>3<th>3.8</th><th>57</th></th></th></th></th></th>	--- <th>15<th>6<th>9<th>3<th>3.8</th><th>57</th></th></th></th></th>	15 <th>6<th>9<th>3<th>3.8</th><th>57</th></th></th></th>	6 <th>9<th>3<th>3.8</th><th>57</th></th></th>	9 <th>3<th>3.8</th><th>57</th></th>	3 <th>3.8</th> <th>57</th>	3.8	57		
San Antonio	787	994.9	1020.2	71	47	59.0	-1.8	80	19	34	11	0	0	45	66	0.34	-1.06	0.26	5	0	0	0	6.2 <th>N<th>32<th>NE<th>24<th>12<td>4</td><td>14</td><td>5.0</td><th>61</th></th></th></th></th></th>	N <th>32<th>NE<th>24<th>12<td>4</td><td>14</td><td>5.0</td><th>61</th></th></th></th></th>	32 <th>NE<th>24<th>12<td>4</td><td>14</td><td>5.0</td><th>61</th></th></th></th>	NE <th>24<th>12<td>4</td><td>14</td><td>5.0</td><th>61</th></th></th>	24 <th>12<td>4</td><td>14</td><td>5.0</td><th>61</th></th>	12 <td>4</td> <td>14</td> <td>5.0</td> <th>61</th>	4	14	5.0	61		
Victoria	109	1015.6	1020.1	73	51	61.9	-0.9	85	19	38	10	0	0	50	67	0.23	-0.00	0.13	2	0	0	0	7.9 <th>---<th>140</th><th>NNW</th><th>24<th>13<td>6</td><th>17<th>5.1<th>57</th></th></th></th></th></th>	--- <th>140</th> <th>NNW</th> <th>24<th>13<td>6</td><th>17<th>5.1<th>57</th></th></th></th></th>	140	NNW	24 <th>13<td>6</td><th>17<th>5.1<th>57</th></th></th></th>	13 <td>6</td> <th>17<th>5.1<th>57</th></th></th>	6	17 <th>5.1<th>57</th></th>	5.1 <th>57</th>	57		
Waco	504	1002.0	1020.7	66	45	55.6	-2.2	77	18	35	10	0	0	44	69	1.82	+1.43	0.27	6	1	0	0	8.2 <th>S<th>---<th>---<th>16<th>13<th>11<th>4.5</th><th>57</th><th>---</th></th></th></th></th></th></th>	S <th>---<th>---<th>16<th>13<th>11<th>4.5</th><th>57</th><th>---</th></th></th></th></th></th>	--- <th>---<th>16<th>13<th>11<th>4.5</th><th>57</th><th>---</th></th></th></th></th>	--- <th>16<th>13<th>11<th>4.5</th><th>57</th><th>---</th></th></th></th>	16 <th>13<th>11<th>4.5</th><th>57</th><th>---</th></th></th>	13 <th>11<th>4.5</th><th>57</th><th>---</th></th>	11 <th>4.5</th> <th>57</th> <th>---</th>	4.5	57	---		
Wichita Falls	1027	983.4	1020.2	63	43	52.7	+1.0	76	18	28	22	0	2	40	66	1.58	+1.19	0.83	5	2	0	0	10.1 <th>S<th>30</th><th>NW</th><th>21<th>17<td>2</td><th>11<th>4.8</th><th>57</th></th></th></th></th>	S <th>30</th> <th>NW</th> <th>21<th>17<td>2</td><th>11<th>4.8</th><th>57</th></th></th></th>	30	NW	21 <th>17<td>2</td><th>11<th>4.8</th><th>57</th></th></th>	17 <td>2</td> <th>11<th>4.8</th><th>57</th></th>	2	11 <th>4.8</th> <th>57</th>	4.8	57		
UTAH																																		
Midford	5028	848.6	1020.7	58	26	41.8	+4.4	70	12	19	19	0	23	---	---	0.13	-0.41	0.11	2	1	1.1	T	--- <th>---<th>---<th>---<th>12</th><th>7</th><th>11</th><th>5.2</th><th>57</th><th>---</th></th></th></th>	--- <th>---<th>---<th>12</th><th>7</th><th>11</th><th>5.2</th><th>57</th><th>---</th></th></th>	--- <th>---<th>12</th><th>7</th><th>11</th><th>5.2</th><th>57</th><th>---</th></th>	--- <th>12</th> <th>7</th> <th>11</th> <th>5.2</th> <th>57</th> <th>---</th>	12	7	11	5.2	57	---		
Salt Lake City	4222	869.6	1019.5	56	36	45.1	+6.8	70	12	20	20	0	11	32	63	0.96	-0.46	0.57	6	0	4	T	10.2	SE	32	NW	23	7	8	15	6.3	58		
VERMONT																																		
Burlington	331	1004.1	1019.0	50	34	47.3	+5.9	69	22	14	6	0	9	34	74	1.38	-1.47	0.66	7	1	4	T	10.0	S	37	S	23	4	7	19	7.8	21		
VIRGINIA																																		
Lynchburg	947	986.8	1021.1	59	37	48.0	+7.7	76	3	30	29	0	12	32	58	1.00	-1.37	0.49	6	0	2.9	2	7.7	SSW	32	W	25	16	5	9	4.2	70		
Norfolk	26	1020.0	1020.9	61	42	51.4	-0.9	79	3	32	27	0	1	42	74	2.74	+0.07	1.69	7	0	T	0	9.4	NE	30	NE	6	13	10	7	5.3	56		
Richmond	157	1015.2	1021.3	62	35	48.5	+1.8	80	3	22	29	0	12	37	71	1.85	-0.64	0.86	7	0	7.3	3	6.3	S	29	S	22 <th>14<td>4</td><th>17<th>4.9</th><th>62</th></th></th>	14 <td>4</td> <th>17<th>4.9</th><th>62</th></th>	4	17 <th>4.9</th> <th>62</th>	4.9	62		
Roanoke	1174	978.7	1021.6	60	36	47.7	+8.8	76	3	19	29	0	12	29	55	1.03	-1.78	0.38	7	0	1.0	T	7.6	NE	--- <th>---<th>13</th><th>9</th><th>8</th><th>7.6</th><th>57</th><th>---</th></th>	--- <th>13</th> <th>9</th> <th>8</th> <th>7.6</th> <th>57</th> <th>---</th>	13	9	8	7.6	57	---		
Washington CO	72	---	---	59	38	48.5	+5.7	77	3	29	7	0	6	---	---	1.76	-1.06	1.09	6	---	6.5	5	5.6	--- <th>77</th> <th>N</th> <th>6</th> <td>---</td> <td>---</td> <td>---</td> <td>5.1</td>	77	N	6	---	---	---	5.1	71		
Wash. Nat'l AP	14	1016.3	1020.7	58	38	48.1	+4.4	76	3	29	24	0	6	35	68	1.50	-1.73	0.64	6	0	6.7	5	7.2	SSW	35	N	6	13 <th>4</th> <th>13</th> <th>5.1</th> <th>71</th>	4	13	5.1	71		
WASHINGTON																																		
Olympic	190	1006.4	1013.9	53	38	45.7	+2.2	61	12	27	22	0	3	43	89	7.79	+1.02	1.15	26	0	T	0	5.1	SSW <th>28</th> <th>S</th> <th>14<td>0</td><td>7</td><th>23</th><th>8.9</th><th>57</th></th>	28	S	14 <td>0</td> <td>7</td> <th>23</th> <th>8.9</th> <th>57</th>	0	7	23	8.9	57		
Seattle CO	14	---	---	55	45	49.7	+2.7	64	11	35	3	0	0	---	---	6.01	+1.55	0.93	24	0	T	0	10.0	--- <th>57</th> <th>SW</th> <th>22</th> <th>2<th>4<th>24</th><th>8.7</th><th>21</th></th></th>	57	SW	22	2 <th>4<th>24</th><th>8.7</th><th>21</th></th>	4 <th>24</th> <th>8.7</th> <th>21</th>	24	8.7	21		
Seattle	14	1012.9	1014.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	7.1	SSE	--- <th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---</th></th></th></th></th>	--- <th>---<th>---<th>---<th>---</th></th></th></th>	--- <th>---<th>---<th>---</th></th></th>	--- <th>---<th>---</th></th>	--- <th>---</th>	---	
Seattle-Tacoma	379	1000.0	1014.2	53	41	46.7	+2.8	61	10	29	3	0	1	43	88	7.22	+2.67	1.20	25	0	T	0	8.5	SE	--- <th>---<th>---<th>---<th>6<th>24</th><th>9.0</th><th>57</th><th>---</th></th></th></th></th>	--- <th>---<th>---<th>6<th>24</th><th>9.0</th><th>57</th><th>---</th></th></th></th>	--- <th>---<th>6<th>24</th><th>9.0</th><th>57</th><th>---</th></th></th>	--- <th>6<th>24</th><th>9.0</th><th>57</th><th>---</th></th>	6 <th>24</th> <th>9.0</th> <th>57</th> <th>---</th>	24	9.0	57	---	
Spokane	2357	946.8	1016.7	47	34	40.3	+4.6	61	10	24	2	0	12	34	79	0.00	-1.12	0.44	13	0	1.1	T	7.9	NE	38	SW	14 <th>1<th>4</th><th>25</th><th>8.7</th><th>26</th></th>	1 <th>4</th> <th>25</th> <th>8.7</th> <th>26</th>	4	25	8.7	26		
Tatoosh CO	101	1008.1	1011.2	54	46	49.8	-2.1	61	10	24	16	0	0	44	82	12.85	+3.33	1.58	26	0	T	0	19.2	E	66	SW	22 <th>0<th>1<th>29</th><th>9.4</th><th>13</th></th></th>	0 <th>1<th>29</th><th>9.4</th><th>13</th></th>	1 <th>29</th> <th>9.4</th> <th>13</th>	29	9.4	13		
Walla Walla CO	949	980.0	1016.3	54	39	46.5	+4.0	71	14	30	3	0	---	---	---	1.97	+1.11	0.64	14	0	0	0	5.2	--- <th>23</th> <th>SE</th> <th>14<th>4<th>3</th><th>23</th><th>8.0</th><th>22</th></th></th>	23	SE	14 <th>4<th>3</th><th>23</th><th>8.0</th><th>22</th></th>	4 <th>3</th> <th>23</th> <th>8.0</th> <th>22</th>	3	23	8.0	22		
Walla Walla	1200	---	---	---	---	---	---	---	---	---	---	---	---	35	---	---	---	---	---	---	---	6.7	S	--- <th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---</th></th></th></th></th>	--- <th>---<th>---<th>---<th>---</th></th></th></th>	--- <th>---<th>---<th>---</th></th></th>	--- <th>---<th>---</th></th>	--- <th>---</th>	---	
Yakima	1061	976.6	1016.3	53	30	41.4	+3.3	63	14	20	3	0	20	34	79	1.18	+0.70	0.35	10	0	T	T	6.5	W	--- <th>---<th>---<th>---<th>2</th><th>8</th><th>20</th><th>8.0</th><th>57</th></th></th></th>	--- <th>---<th>---<th>2</th><th>8</th><th>20</th><th>8.0</th><th>57</th></th></th>	--- <th>---<th>2</th><th>8</th><th>20</th><th>8.0</th><th>57</th></th>	--- <th>2</th> <th>8</th> <th>20</th> <th>8.0</th> <th>57</th>	2	8	20	8.0	57	
WEST VIRGINIA																																		
Charleston	950	984.1	1021.4	57	34	45.6	-0.3	75	21	18	29	0	13	32	63	1.00	-0.17	0.36	7	0	2.5	2	7.5	S <th>26</th> <th>WSW</th> <th>22<th>3<th>14</th><th>13</th><th>6.7</th><th>57</th></th></th>	26	WSW	22 <th>3<th>14</th><th>13</th><th>6.7</th><th>57</th></th>	3 <th>14</th> <th>13</th> <th>6.7</th> <th>57</th>	14	13	6.7	57		
Elkins	1970	951.2	1022.6	53	24	38.5	-0.3	69	23	4	29	0	28	27	---	1.25	-1.62	0.68	9	0	6.0	3	4.2	WNW	33	W	22	14 <th>4</th> <th>12</th> <th>5.2</th> <th>59</th>	4	12	5.2	59		
Huntington CO	863	---	---	59	33	46.1	-0.6	77	3	20	29	0	18	---	---	1.18	-1.61	0.55	6	---	1.2	1	--- <th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---</th></th></th></th></th>	--- <th>---<th>---<th>---<th>---</th></th></th></th>	--- <th>---<th>---<th>---</th></th></th>	--- <th>---<th>---</th></th>	--- <th>---</th>	---	
Parkersburg CO	615	---	---	57	33	44.9	-1.1	75	3	20	29	0	15	---	---	1.02	-1.65	0.43	7	1	2.2	0	5.3	--- <th>24</th> <th>S</th> <th>22<th>9</th><th>8</th><th>13</th><th>5.9</th><th>45</th></th>	24	S	22 <th>9</th> <th>8</th> <th>13</th> <th>5.9</th> <th>45</th>	9	8	13	5.9	45		
Parkersburg	357	---	---	---	---	---	---	---	---	---	---	---	---	32	---	---	---	---	---	---	---	7.7	SW	--- <th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---<th>---</th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>---</th></th></th></th></th>	--- <th>---<th>---<th>---<th>---</th></th></th></th>	--- <th>---<th>---<th>---</th></th></th>	--- <th>---<th>---</th></th>	--- <th>---</th>	---
Petersburg	1013	---	---	58	30	44.0	+0.8	77	3	19	29	0	21	---	---	1.82	+0.18	1.45	7	1	3.0	2	--- <th>---<th>---<th>---<th>---<th>---<th>12</th><th>5</th><th>13</th><th>5.3</th><th>57</th></th></th></th></th></th>	--- <th>---<th>---<th>---<th>---<th>12</th><th>5</th><th>13</th><th>5.3</th><th>57</th></th></th></th></th>	--- <th>---<th>---<th>---<th>12</th><th>5</th><th>13</th><th>5.3</th><th>57</th></th></th></th>	--- <th>---<th>---<th>12</th><th>5</th><th>13</th><th>5.3</th><th>57</th></th></th>	--- <th>---<th>12</th><th>5</th><th>13</th><th>5.3</th><th>57</th></th>	--- <th>12</th> <th>5</th> <th>13</th> <th>5.3</th> <th>57</th>	12	5	13	5.3	57	
WISCONSIN																																		
Green Bay	689	994.6	1017.9	49	30	39.3	+5.8	72	16	14	6	0	19	28	68	0.39	-1.55	0.23	4	0	1.6	1	10.4	SW	50	W	3 <th>9</th> <th>4</th> <th>17</th> <th>6.3</th> <th>48</th>	9	4	17	6.3	48		
La Crosse	652	997.9	1018.1	49	31	39.9	+5.6	74	2	16	28	0	20	30	69	1.49	-0.32	1.11	5	0	1.2	1	12.6	S <th>35</th> <th>WNW</th> <th>2</th> <th>10</th> <th>8</th> <th>12</th> <th>5.7</th> <th>57</th>	35	WNW	2	10	8	12	5.7	57		
Madison	857	986.5	1018.5	50	31	40.5	+5.2	70	16	13	28	0	18	29	67	0.52	-1.77	0.21	5															



# HEATING DEGREE DAYS

(Base 65°F.)

NOVEMBER 1953

Table 3

State and station	Current season			No mails July through this month	State and station	Current season			No mails July through this month	State and station	Current season			No mails July through this month	State and station	Current season			No mails July through this month
	This month	Period July through this month	Period July through this month			This month	Period July through this month	Period July through this month			This month	Period July through this month	Period July through this month			This month	Period July through this month	Period July through this month	
ALABAMA					INDIANA (Cont'd.)					NEW HAMPSHIRE					TENNESSEE (Cont'd.)				
Birmingham	394	486	532		South Bend	668	1088	1289		Concord	711	1421	1636		Nashville	502	632	647	
Mobile	213	255	247		Terre Haute	635	906	1058		Mt. Washington	1199	3958							
Montgomery (CO)	272	322	322																
Montgomery	319	379	373		IOWA					NEW JERSEY					TEXAS				
					Burlington	646	957	1184		Atlantic City (CO)	438	645	766		Abilene	352	438	453	
Flagstaff	803	1736	1832		Des Moines	665	969	1269		Newark	523	763	951		Amarillo	505	696	871	
Phoenix (CO)	124	135	195		Dubuque	741	1189	1511		Trenton (CO)	535	789	922		Austin	236	264	244	
Phoenix	144	167	245		Keokuk (CO)	566									Brownsville	36	36	55	
Prescott	593	779	877		Sioux City	730	1082	1443		NEW MEXICO					Corpus Christi	62	62	113	
Prescott	152	182	246							Albuquerque	554	739	858		Dallas	314	368	352	
Winslow	590	862	957		KANSAS					Clayton	612	936	1064		Del Rio	181	198	214	
Yuma	74	75	105		Condordia (CO)	639	836	1019		Roswell	480	645	665		El Paso	329	415	460	
					Dodge City	635	835	971							Fl. Worth	334	389	357	
					Goodland	746	1111	1333		NEW YORK					Galveston (CO)	117	124	131	
					Topeka (CO)	544	716	914		Albany	681	1256	1386		Galveston	121	127	132	
					Topeka	581	788	1010		Binghamton	712	1378	1623		Houston (CO)	138	153	162	
					Wichita	542	711	848		Buffalo	626	1108	1354		Houston	162	181	188	
										New York (CO)	458	665	863		Laredo	75	77	91	
					KENTUCKY					La Guardia Field	439	618	824		Lubbock	471	623	688	
					Lexington	556	741	951		Rochester	624	1175	1375		Midland	338	338		
					Louisville (CO)	471	613	796		Schenectady	649	1132		Port Arthur	207	235	238		
					Louisville	552	753	862		Syracuse	626	1157	1256		San Angelo	312	397	352	
					Pikeville (CO)	554	703							San Antonio	198	213	226		
										NORTH CAROLINA				Victoria	121	128	131		
					LOUISIANA					Asheville (CO)	545	809	864		Waco	280	322	295	
					Baton Rouge	226	267	242		Asheville	647	1028		Wichita Falls	365	439	524		
					Lake Charles	197	224	240		Charlotte	402	512	592						
					New Orleans (CO)	125	142	146		Greensboro	489	659	741		UTAH				
					New Orleans	146	171			Hatteras (CO)	254	287	307		Milford	689	1208	1404	
					Int. Airport, Moisant	172	207	176		Raleigh (CO)	395	500	515		Salt Lake City (CO)	509	808	1105	
					Shreveport	328	382	358		Raleigh	436	577	603		Salt Lake City	560	920	1240	
										Wilmington	345	411	361						
					MAINE					Winston-Salem	419	555	702		VERMONT				
					Caribou	848	2040	2356							Burlington	676	1410	1617	
					Greenville (CO)	816	1872			NORTH DAKOTA					VIRGINIA				
					Portland	708	1492	1610		Bismarck	866	1493	1989		Lynchburg	504	696	816	
										Devils Lake (CO)	920	1656	2235		Norfolk	403	508	569	
					MARYLAND					Fargo	892	1511	1989		Richmond	488	668	741	
					Baltimore (CO)	454	612	725		Grand Forks	940	1666		Roanoke	514	707	826		
					Baltimore	567	850	857		Pembina	915	1580							
					Frederick	667	1030	911		Williston (CO)	815	1457	2038		WASHINGTON				
					MASSACHUSETTS					OHIO					Olympia	572	1355	1460	
					Boston	487	839	1017		Akron	660	1122	1216		Seattle (CO)	454	894	1097	
					Milton	579	1102			Cincinnati (CO)	518	690	831		Seattle	541	1237	1382	
					Nantucket	507	948	1154		Cincinnati	591	850	1026		Spokane	733	1346	1637	
					Pittsfield	744	1572	1687		Cleveland (CO)	529	826	1016		Tatoosh Island (CO)	448	1563	1832	
										Cleveland	590	940	1124		Walla Walla (CO)	546	836	1076	
					MICHIGAN					Columbus	638	970	1107		Yakima	701	1278	1410	
					Alpena (CO)	721	1449	1744		Dayton	616	898	1096		WEST VIRGINIA				
					Detroit	609	981	1232		Sandusky (CO)	560	862	1077		Charleston	578	812	886	
					Escanaba (CO)	772	1472	1892		Toledo	647	1043	1257		Elkins	787	1365	1300	
					Grand Rapids (CO)	615	1017	1275		Youngstown	651	1161	1189		Huntington (CO)	561	754	794	
					Grand Rapids	671	1177	1471							Parkersburg (CO)	593	858	928	
					Lansing	679	1216	1554		OKLAHOMA					Petersburg (CO)	624	958	1039	
					Marquette (CO)	760	1488	1868		Oklahoma City (CO)	443	580	620						
					Muskegon	660	1202	1493		Oklahoma City	456	585	648		WISCONSIN				
					Sault Ste. Marie	793	1774	2177		Tulsa	433	551	632		Green Bay	763	1373	1733	
					Ypsilanti	662	1051								La Crosse	744	1155	1551	
										OREGON					Madison (CO)	711	1132	1460	
					MINNESOTA					Astoria	455	1104			Madison	728	1197	1544	
					Duluth (CO)	932	1847	2140		Burns (CO)	737	1444	1673		Milwaukee (CO)	634	996	1339	
					Duluth	939	1812	2236		Eugene	488	1012	1183		Milwaukee	682	1103	1445	
					International Falls	974	1987	2490		Meacham	754	1694	1992						
					Minneapolis	767	1185	1601		Medford	486	936	1027		WYOMING				
					Rochester	822	1304	1718		Pendleton	574	994	1174		Casper	767	1342	1796	
					St. Cloud	876	1469	1948		Portland (CO)	420	751	920		Cheyenne	775	1424	1787	
										Portland	485	972	1067		Lander	824	1435	1956	
					MISSISSIPPI					Roseburg	441	886			Rock Springs (CO)	840	1562		
					Jackson	315	389	379		Salem	514	1033	1071		Rock Springs	871	1612	2004	
					Meridian	349	420	428		Sexton Summit (CO)	670	1506	1496		Sheridan	765	1311	1842	
					Vicksburg (CO)	271	341	319											
										PENNSYLVANIA									
					MISSOURI					Allentown	678	1068	1154						
					Columbia	548	756	984		Harrisburg	614	917	1007						
					Kansas City	522	686	905		Park Place (CO)	729	1331	1535						
					St. Joseph	595	830	1000		Philadelphia (CO)	464	625	768						
					St. Louis (CO)	473	626	810		Philadelphia	542	756	889						
					St. Louis	516	704	878		Pittsburgh (CO)	534	815	966						
					Springfield	548	736	933		Pittsburgh	617	1043	1211						
					MONTANA					Reading (CO)	571	815	935						
					Billings	639	1078	1595		Scranton (CO)	644								

# SEVERE STORMS

Table 4

NOVEMBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Blair and Huntingdon Counties, Pa.	Oct. 31- Nov. 3								Wind and fires	Strong winds fanned a series of scattered forest fires, with an estimated 3,000 acres burned over before brought under control.
Puget Sound area, Wash.	1	Night							Wind	Fishing vessel swept into shallow water and wrecked near Whidbey Island. Power lines damaged.
Adak, Alaska	1						\$750,000		do	An 800-foot radio tower at Adak Naval Station blew down and was completely demolished. Adak weather station reported gusts in excess of 90 m.p.h. at the time.
Elbert, El Paso, and Lincoln Counties, Colo.	5	Early morning- late night	*30	90			50,000		Wind and ice (glaze)	Damage mostly to telephone and power lines.
New Jersey, shore area	6-7	P.m., 6th- a.m., 7th				1	6,000,000		Wind, rain, and tides	Most of destruction caused by wind-driven tides. Many cottages and small homes completely washed away. Over 1,000 families evacuated. Much beach erosion. Shore roads and boardwalks caved in. Tremendous destruction to anchored small craft.
New Jersey, all of State ex- cept shore areas	6-7	P.m., 6th- a.m., 7th			5	20	10,000		Snow	In most localities 4- to 8-inch snow was greatest on record for so early in season. Deaths, injuries, and property damage due to traffic accidents. Traffic on South Jersey urban area roads at standstill for several hours.
New England, southern and central areas, es- pecially coastal	6-7	Night of 6-7th and day of 7th					2,000,000		Wind, rain, snow, and high seas	Trees and utility lines downed by high winds. Surface and air transportation disrupted by heavy rain and by snow which ranged up to 7 inches in western Connecticut, where heaviest of record so early in season. Along coasts of Atlantic Ocean and Long Island Sound, high seas pounded ashore, severely damaging seashore communities, especially in Connecticut.
New York, coastal areas	6-7						See remarks		Wind and tides	Northeast gales in conjunction with abnormally high tides caused heavy loss on south shore of Long Island and Staten Island with lesser amounts in New York City and Brooklyn. Ocean driven over seawalls by gale winds, damaging thousands of homes and destroying many, especially in beach communities. 100,000 persons evacuated from their homes, many because electric service for oil burners was cut off for from 36 to 48 hours by broken and falling trees as well as by flood water. Monetary loss in Queens County estimated at \$1,000,000 and on Staten Island at \$675,000; total damage undoubtedly much higher.
Pennsylvan- ia, cen- tral and eastern portions	6-7				3	4			Snow and wind	Heaviest snow of record so early in season in much of this area. In western Potter County and from northeastern Perry to central Clinton County totals ranged from 20 to 28 inches. Some sections received a second lesser storm of 2 to 5 inches on Nov. 7-8. Highway traffic almost at standstill during steady snowfall of 18 to 30 hours. High winds closed many roads with 3- to 4-foot drifts. Trains late; planes grounded. No material damage to utility lines. Vehicles stalled and many abandoned for the night in all sections. Many minor traffic mishaps on slippery highways, and a few major ones. Schools closed in West Chester area. 4 roofs broken by heavy snow in Beavertown area. Depths ranged from 4 to 8 inches in extreme southeastern and northeastern counties and less than 4 inches west of Warren-Fulton County line.
Maryland and Delaware	6-7				3	51			Snow	
Pennsylvan- ia, central and eastern portions	13-16	Nights and early mornings				1	Not avail- able		Fog	Widespread dense fog each night and morning created hazardous driving conditions, slowed traffic, and in this area resulted in at least 1 injury. Delaware River traffic also slowed or halted.
Puget Sound and Seattle areas, Wash.	14	7-10 p.m.							Wind	Falling trees caused local power and telephone failures from Tacoma to Everett. Ferry service interrupted for 2 hours by high winds.
El Reno (2½ miles east of), Okla.	18	10:40 p.m.	17	**100	0	0	500	\$0	Tornado	Damage to buildings on 1 farmstead.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

NOVEMBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Maulk Air- port (near Blackwell), Okla.	19	8:25-8:39 a.m.	Nar- row	Short	0	0	\$0	\$0	Tornado	Small tornado observed southeast of Maulk Airport, moving northeastward. Struck ground in wheat field then lifted. Most of time when observed it was about 300 feet off ground.
Sulphur, Okla.	19	10:20- 10:30 a.m.	33	2	0	0	15,000	0	Tornado and hail	Marble-sized hail fell for 5 minutes; no damage by hail. Property damage to roofs, trees, TV antennae, and signs.
Muskogee, Okla.	19	11 a.m.	Nar- row	Short	0	0	1,300	0	Tornado	Funnel cloud observed when it struck pile of lumber and lifted boards into air. Also tore roof of shed and uprooted trees. Northeasterly path, crossing 2 streets in Muskogee.
Palestine, Anderson County, Tex.	19	12:50 p.m.	50		0	0	9,900		Tornadoes and elec- trical	3 funnel clouds observed south of city limits; second and third merged; moved northward. Airport hangar and workshop damaged to extent of \$6,500. Several homes and garages damaged, particularly in Southview area. 2 bulls killed by lightning.
New Orleans, Orleans Parish, La.	19-20	Afternoon 19th- morning, 20th			2	5	5,000		Rain and elec- trical	Record 7.77 inches of rain in 24 hours jammed traffic, flooded streets, many homes, and stores, and knocked out power lines. Between noon and midnight city police reported 58 accidents, many of them occurred when automobiles struck open manholes, after heavy covers were washed away by water. Lightning damaged 1 home. Shrubby and other property damaged.
Flournoy, Caddo Par- ish, La.	19	Afternoon					500		Hail	Damaged windows in homes and businesses. Hail reported as large as hens' eggs.
Caddo and Bossier Parishes, La.	19	Afternoon					20,000		Wind, rain and hail	A hangar and 2 small planes damaged. Power lines downed in Shreveport and vicinity.
Little Rock, (southern suburbs), Ark.	19	7-7:45 p.m.	*1½	5			35,000		Wind and hail	Several barns and sheds destroyed by wind in Mabelvale-Base Line Road areas to south of Little Rock. Very light hail.
Kansas, western portion	19-20						12,000		Glaze (ice), drifting snow, and wind	Ice-coated overhead wires tangled by strong winds caused failure of about 250 long-distance lines. Many roads northwest of line from Sharon Springs to Phillipsburg snow-blocked on morning of 20th.
Pennsylvania, south- eastern portion	19-21				3	12			Fog, smoke, and haze	Fog, haze, factory smoke, and motor exhaust fumes accumulated in industrial areas to such an extent highway and river traffic slowed; fumes entered homes, offices, factories, and brought tears to eyes, which resulted in hospitalizing at least 12 persons in Philadelphia area. 3 killed in traffic accident due to fog on highway, near West Chester.
South Dako- ta, eastern portion	20						225,000		Ice (glaze), snow, and winds	Heavy ice on telephone wires and high winds damaged Bell Telephone Company installations by breaking 550 poles and causing 17,000 wire breaks. It put 350 long-distance circuits and 2,200 rural telephones out of service. Some 49 communities in 17 southeastern counties cut off from outside telephone communications. Power lines interrupted for 24 hours and considerable damage sustained. Ice storm covered area southeastward of line that extended from Wagner in Charles Mix County northeastward to Clear Lake in Deuel County. Snowstorm extended northwest of this line in belt 80 to 130 miles wide, with amounts ranging from 5 to 13 inches. Roads blocked temporarily by strong winds and snow.
Minnesota, extreme southwest- ern coun- ties	20-21						300,000		Glaze (ice), sleet, snow, and wind	Extensive damage to overhead wire systems, principally to telephone lines. Many poles, wires, and antennae downed, and communication and electric power services seriously disrupted. Trees badly damaged. Traffic delayed. Many rural schools closed. Storm especially severe in Lake Benton area, Lincoln County, where loss to overhead wire-systems reported to be greatest in many years.
Gulfport, Harrison County, Miss.	21-22	Late p.m. -early a.m.					5,000		Wind and rain	Roofs damaged, glass windows broken, signs torn loose or blown down, and trees and shrubby damaged.
Luling (near), St. Charles Parish, La.	21	Late evening			0	0	2,500	2,500	Tornado	Destroyed several barns.

See footnotes at end of table.

# SEVERE STORMS

Table 4—Continued

NOVEMBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Youngsville, Broussard, and Cypress Island, Lafayette and St. Martin Parishes, La.	21	10-11 p.m.	300	18	0	2	\$200,000	\$50,000	Tornado	Moved northeastward. Destroyed 30 homes and many outbuildings, including many barns; many livestock killed. About 200 persons left homeless. 1 sugar mill heavily damaged.
Puget Sound area, Wash.	21-22						7,000		Wind and tides	Several plate-glass windows broken and power lines damaged. 9 dairy cows electrocuted by broken power line near Duvall. High tide accompanied by strong winds flooded Coast Guard airport runways at Ediz Hook, Port Angeles, on Sunday.
Panama City (20 miles northwest of), Fla.	22	8:20 a.m.			0	22			Tornado	Storm struck in Woodville community, destroying 5 homes and lifting another off its foundation. Several automobiles damaged. Homes destroyed were within 200 yards of one another.
Corry, Pa.	22	7:30 p.m.	65	2	0	2	\$60,000		Tornado and winds	Active thunderstorm winds over most of Corry. Tornado action confined to a few blocks at west end of city. Roofs and sidewalls of 2 houses torn off or badly damaged (\$15,000); several other houses had lesser damage; several garages and smaller buildings wrecked or damaged. Scores of trees uprooted or broken, felling utility lines. At least 3 cars damaged and 2 persons injured. Storm entered area from southwest.
Lewiston, Idaho	22	P.m.							Wind	Wind gusts up to 64 m.p.h. caused minor damage to power lines.
Boulder to Colorado Springs, Colo.	22-24		*50	120			60,000		do	Strong wind with gusts of 80 to 90 m.p.h. damaged buildings, trees, TV antennae and towers.
Landisville, Pa.	23	2 a.m.	1 block		0	0			Tornado, winds, and electrical	Active thunderstorms in Lancaster County area, but locally in Landisville small tornado action took roof and rafters off house (\$2,000 damage) and carried them 150 feet away. Storm window blown out of another house; other minor damage. Storm moved from southwest. Lightning caused \$300 damage.
Rutland-Orwell area, Vt.	23	Early morning					30,000		Wind	Damage to homes and farm buildings. Utility lines downed by fallen trees.
Stibnite, Idaho	23	Morning							do	High winds reported at numerous points in southwestern Idaho (including 57 m.p.h. at Boise Air Terminal), but only Stibnite reported damage to power distribution system.
Lake Wales (vicinity of), Fla.	24	5:30 p.m.					°Several thousand dollars		Wind and rain	Wind broke tree limbs, power lines, awnings and ornamental plants, and blew considerable grapefruit from trees. Heavy rains damaged roadways and caused soil erosion and leeching of fertilizer.
Maine, southern and central portions	25	Afternoon and night				1	50,000		do	Air and surface travel delayed by heavy rain and southeast gales. Trees and utility lines downed. Church steeple in Wiscasset and boat shed in Raymond blown down. Fishing boat in Portland Harbor driven from moorings, damaging itself and 2 other craft.
Port St. Joe, Fla.	25	11 p.m.							Wind	Plate-glass windows broken and signs torn down.
Chambersburg area, Pa.	28	Day							Snow	Snow-coated highways were scene of 2 skidding accidents which badly damaged 2 cars and tore down an iron fence and light standard.

\* Miles instead of yards.

\*\* Yards instead of miles.

° Crop damage included with other property damage.



# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

## NOVEMBER 1953

Damaging floods occurred in Oregon and northern California during November. Two lives were lost and some families in the lowlands of southwestern Oregon were forced to evacuate their homes. Some scattered local flooding was reported, but generally most streams continued at abnormally low levels over extensive areas. A new record-low stage was reached on the Mississippi River at Memphis, Tenn.

**ATLANTIC SLOPE.**--Precipitation was near normal in the State of Maine during the month, but heavy rain on the 25th caused the Androscoggin and Kennebec to rise to their highest levels since last spring. Flow reached 23,000 cfs on the Androscoggin at Lewiston.

River stages along the remainder of the Atlantic seaboard remained low and approached within a few tenths of a foot of record-low stages at several points in the Middle Atlantic States.

### MISSISSIPPI SYSTEM.

**Ohio Basin.**--Heavy snow (26 inches) occurred over the upper Allegheny Basin on the 6th and 7th in the Olean, N. Y., area. Most of the snow fell during the 12-hour period between 8 p.m. on the 6th and 8 a.m. on the 7th. Long-time residents of Olean said they had never seen so much snowfall in such a short period of time. Driving conditions became hazardous and finally almost impossible, with cars and trucks being abandoned by scores on all roads in all directions from Olean. Only minor rises of several tenths of a foot resulted from the snow runoff in the upper Allegheny Basin.

All streams in the Ohio Basin remained at very low stages throughout the month. At Queen Shoals, W. Va., the discharge on the 3d to 5th reached a new minimum based on a period of 25 years. At this station the stage remained at 2.72 feet between the 3d and 5th; on the 8th, it was 2.65 feet.

**Arkansas Basin.**--Rainfall over the Arkansas Basin was very sparse during November. The only significant rainfall occurred between the 18th

and 20th. Very little runoff occurred from this storm. The average monthly stage of the Cimarron River at Perkins, Okla., was 4.1 feet, 0.5 foot below normal. Only two previous Novembers of record produced a lower average monthly stage; these were 1947 and 1952, with readings of 3.5 feet and 2.7 feet, respectively. The average monthly stage of the Arkansas River at Tulsa, Okla., was 3.2 feet, 1.6 feet below normal. Previous Novembers with lower average monthly stages were those of 1939, 1947, and 1952, with average monthly stages of 2.9 feet, 3.0 feet and 3.0 feet, respectively.

**Lower Mississippi Basin.**--For the second consecutive month the Lower Mississippi reached a new record-low stage of 3.5 feet below zero at Memphis, Tenn., on the 19th and again on the 21st.

**PACIFIC SLOPE DRAINAGE.**--Damaging floods occurred in southwestern Oregon and northern California during the last week of the month. One northern California city was virtually isolated in Del Norte County on the northwest coast. All roads out of Crescent City were blocked by slides or high water. This flood was due to moderate to heavy rainfall which occurred between the 21st and 23d. The precipitation averaged 5.03 inches over the Umpqua Basin, 5.85 inches over the Rogue, 14.12 inches over the Smith, and 7.13 inches over the Coos and Coquille Basins. The Gasquet Ranger Station in the Smith River Basin reported 23 inches in 48 hours.

Main flood damage appears to have been to livestock along the Smith and Coquille Rivers. On the Rogue River the main damage was the loss of a coffer-dam at Savage Rapids. Two lives were lost and some families in the lowlands of southwestern Oregon were forced to evacuate their homes.

Streams in northwest Oregon and in the Willamette Basins were flooded between the 23d and 26th from the heavy rainfall on the 22d and 23d. The runoff was heavy as the soil was thoroughly saturated from nearly 12 days of consecutive rainfall.

## FLOOD STAGE DATA

(All dates in November unless otherwise specified)

Table 5

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
PACIFIC SLOPE DRAINAGE <u>Columbia Basin</u>	<i>Ft.</i>			<i>Ft.</i>	
Smith: Crescent City 8NE, Ore.	35	22	23	38.0	23
Rogue:					
Eagle Point 4W, Ore. (Dodge Bridge)	9	22	23	10.9	23
Raygold, Ore.	10.5	22	24	17.0	23
Grants Pass, Ore.	17	23	23	21.2	23
Umpqua:					
Winston, Ore.	28	23	23	29.1	23
Winchester, Ore.	13	22	24	19.7	23
McKenzie: Coburg, Ore.	11	23	23	15.3	23
Calapooya: Holley, Ore.	10.5	22	22	12.2	12

NOVEMBER 1955

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
PACIFIC SLOPE DRAINAGE (Cont'd.) Columbia Basin (Cont'd.)					
Santiam: Waterloo, Ore.	20	23	23	20.2	22
Willamette:					
Harrisburg, Ore.	12	23	23	16.5	23
Corvallis, Ore.	20	24	25	22.0	24
Albany, Ore.	20	24	25	22.4	25
Oregon City, Ore. (Upper Gage)	12	25	27	12.5	26
(Lower Gage)	25	25	27	26.5	26

\* Provisional

# RADIOSONDE DATA

Average monthly values

Table 20

NOVEMBER 1953

ALBUQUERQUE, N. MEX. ( 840 MB. )					ATLANTA, GA. ( 985 MB. )					BIG SPRING, TEX. ( 932 MB. )					BISMARCK, N. DAK. ( 956 MB. )					BOISE, IDAHO ( 917 MB. )					BROWNSVILLE, TEX. (1018 MB. )					BUFFALO, N. Y. ( 992 MB. )				
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity						
SURFACE	30	1,619	8.7	50	29	309	10.0	68	13	784	11.6		30	505	1.6	76	30	868	7.4	66	30	7	18.4	81	30	221	5.8	74						
1,000----	30	146			29	184			13	189			30	136			30	147			30	155	1.0		30	155	1.0							
950----	30	587			29	619	12.2	45	13	622			30	557	3.0	70	30	580			30	606	17.2	68	30	582	5.7	64						
900----	30	1,047			29	1,066	9.3	45	13	1,079	12.3		30	993	4.5	56	30	1,027	10.0	52	30	1,065	14.7	58	30	1,017	3.1	64						
850----	30	1,523			29	1,537	6.8	43	13	1,557	10.4		30	1,458	2.4	54	30	1,500	7.6	50	30	1,547	13.0	48	30	1,478	4.4	61						
800----	30	2,027	8.5	37	29	2,034	5.0	39	13	2,060	8.4		30	1,947	7.4	48	30	1,996	4.1	53	30	2,054	11.0	40	30	1,963	1.6	52						
750----	30	2,563	5.5	36	29	2,567	3.0	34	13	2,595	6.2		30	2,469	1.5	46	30	2,525		6	56	30	2,595	8.4	36	30	2,483	3.6	46					
700----	30	3,117	1.6	38	29	3,114		31	13	3,154	3.4		30	3,009	4.5	45	30	3,068	3.0	59	30	3,157	5.6		30	3,017	6.1	43						
650----	30	3,714	2.2	39	29	3,710	3.3		13	3,756			30	3,596	7.8	44	30	3,658	6.7	63	30	3,764	2.5		30	3,601	9.2	43						
600----	30	4,342	5.8	35	29	4,333	7.1		13	4,388	3.3		30	4,208	11.3	42	30	4,272	10.5	61	30	4,402	1.3		29	4,204	13.3	43						
550----	30	5,018	10.1		29	5,008	11.3		13	5,072	7.3		30	4,876	15.5	42	30	4,940	14.5	51	30	5,090	5.9		29	4,864	17.4	42						
500----	30	5,747	14.7		29	5,731	16.4		12	5,804	11.9		30	5,583	20.5	42	30	5,653	19.1	49	30	5,829	10.8		29	5,569	22.1							
450----	30	6,550	20.1		29	6,529	21.5		12	6,610	17.8		30	6,359	26.4	43	30	6,436	24.7	50	29	6,638	16.3		29	6,343	27.7							
400----	30	7,400	26.3		29	7,375	27.2		12	7,474	24.0		30	7,194	32.5	43	30	7,276	30.4	47	28	7,505	22.5		28	7,175	33.3							
350----	30	8,350	33.6		29	8,322	34.3		12	8,434	31.2		30	8,121	39.3		30	8,212	37.1	48	28	8,470	29.5		28	8,100	39.8							
300----	30	9,413	41.4		29	9,384	41.1		12	9,505	39.8		28	9,161	46.2		30	9,260	44.6		28	9,548	38.0		27	9,135	46.7							
250----	30	10,625	50.2		29	10,601	48.9		12	10,724	49.4		28	10,355	52.5		30	10,458	52.2		27	10,778	47.2		27	10,328	52.1							
200----	30	12,047	57.6		28	12,032	56.4		11	12,153	59.1		28	11,779	56.9		30	12,217	57.7		27	12,517	57.3		25	11,768	54.9							
175----	30	12,882	60.5		27	12,871	58.7		11	12,982	62.5		28	12,623	57.0		30	12,722	58.2		27	13,051	61.8		25	12,619	55.6							
150----	30	13,836	62.9		27	13,833	60.8		10	13,935	64.2		28	13,597	56.9		30	13,691	58.8		25	13,991	65.4		24	13,601	56.1							
125----	30	14,951	65.4		27	14,960	63.4		10	15,046	65.6		26	14,752	57.9		28	14,830	60.6		24	15,085	68.9		23	14,749	58.0							
100----	30	16,302	66.7		24	16,319	64.6		10	16,397	66.7		24	16,159	59.4		27	16,211	61.1		20	16,410	70.4		23	16,355	59.3							
80----	30	17,650	65.2		21	17,683	63.6		10	17,745	66.3		22	17,558	58.8		23	17,599	59.9		14	17,737	68.2		21	17,531	59.4							
60----	30	19,412	63.2		17	19,464	60.9		9	19,503	62.9		18	19,365	58.7		19	19,392	58.4		10	19,481	63.2		21	19,327	60.5							
50----	30	20,544	60.9		16	20,600	59.6		8	20,632	61.0		16	20,514	59.1		9	20,539	58.1		9	20,609	60.5		19	20,460	60.1							
40----	30	21,942	58.7		14	22,001	58.1		7	22,031	57.7		7	21,931	57.7		12	21,942	56.6		7	22,008	56.7		17	21,852	60.1							
30----	30	23,758	57.1		9	23,817	54.9																	11	23,682	59.0								

BURRWOOD, LA. (1019 MB. )					CARIBOU, ME. ( 995 MB. )					CHARLESTON, S. C. (1020 MB. )					COLUMBIA, MO. ( 991 MB. )					DODGE CITY, KANS. ( 928 MB. )					EL PASO, TEX. ( 884 MB. )					ELY, NEV. ( 811 MB. )				
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity						
SURFACE	30	3	17.5	84	30	191	2.3	87	30	13	9.9	87	30	238	7.7	58	30	792	5.4	77	30	1,195	12.4	37	30	1,908	2.6	55						
1,000----	30	167	17.9	70	30	151	4.4		30	180	15.0	62	30	163	2.5		30	168			30	1,143			30	1,663								
950----	30	605	15.2	61	30	568	1.7	75	30	617	12.9	55	30	592	8.3	50	30	595			30	585			30	598								
900----	30	1,061	12.9	54	30	1,001	1.1	74	30	1,065	11.0	51	30	1,033	5.7	50	30	1,040	7.8	54	30	1,047			30	1,050								
850----	30	1,539	10.8	49	30	1,457	1.7	73	30	1,540	8.8	43	30	1,499	4.1	42	30	1,511	7.3	43	30	1,527	13.7	27	30	1,519								
800----	30	2,042	8.5	48	30	1,938	3.0	62	30	2,039	6.6	39	30	1,990	2.2	42	30	2,008	5.3	40	30	2,025	10.5	27	30	2,016	6.1	47						
750----	30	2,580	5.8	46	30	2,455	4.7	55	30	2,576	3.9	35	30	2,516	1.1	39	30	2,538	2.9	40	30	2,572	7.5	26	30	2,546	4.0	45						
700----	30	3,135	2.9	42	30	2,988	7.4	51	30	3,125	1.6		30	3,059	2.8	37	30	3,088		32	30	3,133	3.8	26	30	3,099	1.1	49						
650----	30	3,737	3.3	38	30	3,565	10.2	44	30	3,726	1.3		30	3,647	6.2	35	30	3,681	3.7	39	30	3,736	1.1		30	3,690	3.6	47						
600----	30	4,368	3.9		30	4,175	13.3	38	30	4,352	5.2		30	4,264	10.0		30	4,304	7.7		30	4,366	4.0		30	4,317	3.7	41						
550----	30	5,051	8.0		30	4,837	17.5	39	30	5,033	9.5	41	30	4,934	14.3		30	4,976	11.8		30	5,050	8.0		30	4,986	11.4	40						
500----	30	5,783	12.4		30	5,539	22.3	38	30	5,759	14.7		30	5,646	19.2		30	5,699	17.1		29	5,787	12.8		30	5,716	16.0	38						
450----	30	6,586	17.4		30	6,314	27.9	36	30	6,559	19.9		30	6,428	24.9		30	6,488	23.0		29	6,589	18.5		30	6,507	21.1	38						
400----	30	7,453	23.3	40	30	7,140	33.9		30	7,412	25.8	35	30	7,271	30.9		30	7,333	29.4		29	7,451	24.7		30	7,361	27.3	37						
350----	30	8,414	30.8	41	30	8,062	40.7		30	8,366	32.3		29	8,204	38.0		29	8,266	36.2		29	8,407	32.0		30	8,309	34.5							
300----	30	9,489	38.5		30	9,095	47.3		30	9,435	40.4		29	9,247	45.5		29	9,319	43.2		29	9,475	40.3		30	9,368	42.6							
250----	30	10,718	47.2		27	10,275	53.1		30	10,652	49.4		29	10,442	52.3		29	10,525	50.5		29	10,691	49.2		30	10,586	50.8							
200----	30	12,158	57.3		25	11,686	55.8		30	12,085	57.5		28	11,87																				



# RADIOSONDE DATA

Average monthly values

Table 20—Continued

NOVEMBER 1953

Standard pressure surface (mb.)	INTERNAT. FALLS, MINN. ( 973 MB.)				LAKE CHARLES, LA. (1020 MB.)				LANDER, WYO. ( 829 MB.)				LAS VEGAS, NEV. ( 940 MB.)				LITTLE ROCK, ARK. (1012 MB.)				MAZATLAN, MEXICO (1011 MB.)				MEDFORD, ORE. ( 970 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	360	- 0.6	79	30	5	13.5	76	30	1,696	2.6	57	30	660	12.5	33	30	79	8.6	63	30	14	25.4	72	30	401	9.2	85
1,000---	30	134			30	175	15.7	59	30	148			30	137			30	175	12.7	45	30	108	24.7	70	30	142		
950----	30	548			30	610	14.1	57	30	581			30	574			30	611	11.1	44	30	567	24.1	41	30	574	10.0	75
900-----	30	900	- .6	65	30	1,064	11.9	53	30	1,026			30	1,032	15.2	28	30	1,054	8.3	44	30	1,029	21.4	40	30	1,020	8.7	67
850-----	30	1,437	- 1.0	54	30	1,541	10.0	49	30	1,495			30	1,512	11.9	29	30	1,524	6.9	35	30	1,521	18.4	37	30	1,490	6.1	64
800-----	30	1,919	- 2.3	49	30	2,043	7.8	50	30	1,991	5.7	41	30	2,017	8.7	31	30	2,021	5.0	37	30	2,037	14.7		30	1,985	3.1	64
750-----	30	2,434	- 4.8	48	30	2,580	5.4	46	30	2,522	2.8	40	30	2,554	5.4	32	30	2,553	2.6	39	30	2,589	11.0		30	2,510	- .1	61
700-----	30	2,970	- 7.2	47	30	3,134	2.5	44	30	3,071	- .7	41	30	3,108	2.0	32	30	3,100	- .4	41	30	3,152	7.4		30	3,055	- 2.6	55
650-----	30	3,551	- 9.9	40	30	3,734	- .9	40	30	3,664	- 4.7	43	30	3,708	- 1.4	31	30	3,694	- 3.8		30	3,761	3.6		30	3,643	- 6.0	55
600-----	30	4,157	-13.6	37	30	4,364	- 4.4	36	30	4,262	- 8.9	39	30	4,335	- 5.3		30	4,317	- 7.5		30	4,403	- .4		30	4,261	- 9.7	51
550-----	30	4,818	-18.1	36	30	5,045	- 8.4		30	4,954	-13.0	39	30	5,014	- 9.8	31	30	4,993	-11.6		30	5,094	- 4.8		29	4,932	-14.0	48
500-----	30	5,518	-22.7	36	30	5,777	-13.2		30	5,670	-18.1	41	30	5,742	-14.7		30	5,713	-16.3		30	5,835	- 9.9		29	5,646	-18.5	47
450-----	30	6,291	-28.2	35	30	6,581	-18.6		30	6,452	-23.6	39	30	6,539	-20.3		30	6,506	-21.6		30	6,641	-15.4		29	6,429	-24.0	49
400-----	29	7,111	-34.5		30	7,440	-24.6		30	7,298	-29.9		30	7,394	-26.4		30	7,356	-27.8		30	7,520	-21.4		29	7,273	-29.9	52
350-----	29	8,030	-41.4		30	8,396	-31.8		30	8,236	-36.9		30	8,343	-33.5		30	8,301	-34.7		30	8,490	-28.5		30	8,212	-36.3	49
300-----	29	9,060	-48.2		30	9,466	-39.6		30	9,285	-44.6		30	9,405	-41.5		30	9,361	-41.9		29	9,580	-36.2		30	9,260	-43.6	
250-----	29	10,244	-53.9		30	10,686	-48.8		26	10,474	-52.7		29	10,612	-50.3		30	10,574	-49.3		26	10,823	-45.8		28	10,464	-51.2	
200-----	28	11,657	-56.2		30	12,123	-56.6		24	11,894	-58.2		28	12,036	-58.2		30	12,011	-55.8		19	12,284	-56.4		28	11,892	-57.3	
175-----	28	12,505	-56.0		29	12,955	-60.3		22	12,724	-58.9		26	12,871	-60.5		14	13,134	-61.1		11	13,384	-61.1		27	12,730	-58.2	
150-----	28	13,485	-55.7		29	13,908	-63.0		21	13,684	-59.2		27	13,816	-62.4		29	13,821	-59.3		11	14,073	-66.2		25	13,687	-58.3	
125-----	27	14,643	-56.3		28	15,020	-65.8		21	14,825	-61.5		27	14,934	-64.5		27	14,943	-61.4		8	15,160	-70.3		23	14,820	-59.6	
100-----	26	16,058	-56.8		27	16,370	-67.1		17	16,205	-61.6		27	16,290	-66.3		26	16,319	-64.3		6	16,470	-74.7		22	16,214	-60.6	
80-----	25	17,470	-57.5		24	17,716	-65.5		15	17,584	-59.8		25	17,646	-65.1		25	17,684	-63.7						17	17,611	-60.5	
60-----	19	19,300	-57.7		18	19,482	-62.3		13	19,398	-58.9		23	19,411	-62.2		18	19,459	-62.6						9	19,397	-58.6	
50-----	15	20,452	-57.6		15	20,609	-60.9		11	20,540	-58.8		21	20,542	-60.6		13	20,585	-61.1						5	20,546	-57.9	
40-----	8	21,649	-58.9		5	23,848	-58.4						19	21,935	-59.6		9	21,962	-59.7						5	21,946	-58.6	
30-----					5	23,848	-55.6						14	23,745	-58.1													
Standard pressure surface (mb.)	MERIDA, MEXICO (1014 MB.)				MIAMI, FLA. (1017 MB.)				MIDLAND, TEX. ( 916 MB.)				NANTUCKET, MASS. (1018 MB.)				NASHVILLE, TENN. (1001 MB.)				NORTH PLATTE, NEBR. ( 919 MB.)				OAKLAND, CALIF. (1016 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	27	23.9	79	30	4	21.1	83	16	871	10.1	51	30	14	8.2	88	30	177	7.8	61	30	848	1.4	82	30	6	13.2	80
1,000---	30	152	23.5	77	30	153	21.4	75	16	131			30	161	9.9	74	30	181	8.8	48	30	159			30	154	13.4	74
950----	30	600	21.2	74	30	597	18.7	76	16	566			30	582	7.9	70	30	606	9.6	41	30	584			30	584	12.4	64
900-----	30	1,067	18.2	76	30	1,059	15.8	76	16	1,022	12.7	44	30	1,030	5.6	68	30	1,056	6.1	38	30	1,020	5.2	65	30	1,038	10.6	58
850-----	30	1,555	15.0	73	30	1,543	13.1	73	16	1,501	12.0		30	1,495	3.2	59	30	1,521	4.9	34	30	1,487	5.3	49	30	1,512	8.1	54
800-----	30	2,066	12.9	62	30	2,051	11.2	59	16	2,006	9.7		30	1,995	1.6	44	30	2,014	3.4		30	1,981	3.3	50	30	2,011	5.8	49
750-----	30	2,607	10.3	55	30	2,590	9.1	45	16	2,548	6.6		30	2,507	- .6	39	30	2,542	- .8		30	2,506	1.1	48	30	2,542	3.4	39
700-----	30	3,179	8.3	39	30	3,157	6.3	40	16	3,101	2.9		30	3,051	- 3.0	39	30	3,086	- 2.1		30	3,054	- 1.8	45	30	3,093	- 1.1	38
650-----	29	3,791	4.7	34	30	3,763	3.2	35	16	3,704	- .6		30	3,637	- 6.2	39	30	3,677	- 5.1		29	3,648	- 5.2	51	29	3,692	- 3.1	40
600-----	27	4,433	- .8		30	4,406	- 1.3	30	16	4,333	- 4.5		30	4,257	- 9.6	38	30	4,296	- 8.7		29	4,268	- 8.9	49	29	4,318	- 7.1	35
550-----	26	5,127	- 3.5		30	5,095	- 4.4	30	15	5,013	- 9.3		30	4,926	-13.9	38	30	4,967	-13.0		29	4,937	-12.8		29	4,992	-10.0	
500-----	25	5,871	- 8.2		30	5,841	- 9.1	31	15	5,742	-14.4		30	5,640	-17.8	40	30	5,684	-18.1		28	5,657	-17.5		29	5,717	-15.8	32
450-----	24	6,608	-13.4		30	6,556	-14.7	34	15	6,536	-20.4		30	6,425	-24.0	40	30	6,471	-23.6		28	6,438	-23.3		29	6,510	-20.9	
400-----	24	7,566	-19.8		30	7,531	-20.7		15	7,394	-26.4		30	7,267	-29.9		30	7,313	-29.4		30	7,284	-29.8	39	29	7,364	-27.0	
350-----	23	8,541	-27.0		30	8,503	-28.3		15	8,344	-33.3		30	8,204	-36.7		30	8,253	-35.9		28	8,221	-36.8		29	8,312	-34.0	
300-----	23	9,633	-35.3		29	9,587	-36.8		15	9,408	-41.0		30	9,254	-44.1		30	9,306	-43.1		27	9,264	-44.5		29	9,373	-42.0	
250-----	20	10,874	-45.5		29	10,821	-46.6		15	10,624	-49.1		30	10,455	-51.5		30	10,515	-50.0		25	10,467	-52.1		29	10,584	-50.3	
200-----	19	12,328	-57.1		27	12,268	-57.3		14	12,056	-56.1		28	11,8														

# RADIOSONDE DATA

Average monthly values

Table 20—Continued

NOVEMBER 1953

SAN ANTONIO, TEX. ( 992 MB.)				SAN JUAN, P. R. (1012 MB.)				SANTA MARIA, CALIF. (1010 MB.)				S. STE. MARIE, MICH. ( 990 MB.)				SPOKANE, WASH. ( 931 MB.)				SWAN ISLAND, W. I. (1013 MB.)				TACUBAYA, MEXICO ( 775 MB.)							
Standard pressure surface (mb.)																															
Number of observations				Dynamic height				Temperature				Relative humidity				Number of observations				Dynamic height				Temperature				Relative humidity			
SURFACE	30	243	13.8	66	30	19	25.4	84	30	71	12.7	79	30	221	3.0	86	30	722	5.0	77	30	10	25.7	84	30	2,306	14.0	59			
1,000----	30	173			30	124	25.1	81	30	154	13.7	72	30	134	-.5		30	135			30	125	25.2	82	30	91					
950----	30	608	14.8	57	30	584	22.3	81	30	591	14.4	57	30	555	2.7	71	30	561			30	579	22.4	82	30	551					
900----	30	1,064	12.1	59	30	1,043	19.2	81	30	1,043	12.8	49	30	967	-.9	68	30	1,002	5.7	67	30	1,045	19.7	79	30	1,025					
850----	30	1,540	9.9	56	30	1,533	16.4	79	30	1,520	10.5	40	30	1,445	-.9	65	30	1,468	3.7	59	30	1,536	16.8	78	30	1,513					
800----	30	2,043	8.8	44	30	2,048	13.7	75	30	2,023	8.3	32	30	1,927	-3.0	61	30	1,958	-.5	60	30	2,051	13.9	72	30	2,041					
750----	30	2,575	6.7	38	30	2,597	11.2	66	30	2,559	5.9	28	30	2,438	-4.9	52	30	2,478	-2.6	58	30	2,598	11.7	66	30	2,588	12.7	54			
700----	30	3,139	4.1	30	30	3,164	8.0	57	30	3,115	2.7	32	30	2,976	-7.7	48	30	3,017	-6.0	58	30	3,169	8.8	57	30	3,156	8.6	57			
650----	30	3,739	.7		30	3,781	4.7	50	30	3,714	-.3	28	30	3,554	-10.9	48	30	3,601	-9.4	57	30	3,784	5.5	49	30	3,769	4.1	63			
600----	30	4,375	-3.1		29	4,421	1.3	40	30	4,346	-4.2	30	30	4,159	-14.6	48	30	4,208	-12.9	51	29	4,429	1.9	48	30	4,411	-.5	65			
550----	30	5,069	-7.4		29	5,117	-2.4		30	5,027	-8.4	29	30	4,816	-18.6	45	30	4,871	-16.8	45	28	5,128	-1.9	48	30	5,108	-3.7	49			
500----	30	5,794	-12.5		29	5,867	-6.7		30	5,760	-13.2	29	30	5,517	-23.5	44	30	5,576	-21.6	41	28	5,878	-6.3	43	30	5,850	-8.3	53			
450----	30	6,597	-18.1		29	6,696	-11.8		30	6,560	-18.9	29	30	6,284	-29.0	46	29	6,355	-26.8	41	28	6,704	-11.3	39	30	6,671	-13.3				
400----	30	7,460	-24.5		29	7,574	-17.8		30	7,421	-25.5	29	30	7,111	-35.0	47	29	7,188	-32.6	44	28	7,588	-17.1	38	30	7,548	-19.3				
350----	30	8,418	-31.7		29	8,557	-25.1		30	8,374	-32.9	29	30	8,029	-41.6		29	8,116	-39.2		27	8,576	-23.8		29	8,527	-26.5				
300----	30	9,490	-39.6		29	9,656	-33.9		30	9,439	-41.3	29	30	9,058	-48.1		29	9,156	-46.3		26	9,660	-32.6		29	9,622	-34.8				
250----	30	10,713	-48.2		29	10,906	-43.7		30	10,652	-50.1	29	29	10,238	-53.2		29	10,346	-53.6		24	10,935	-43.2		28	10,870	-44.5				
200----	30	12,152	-57.2		29	12,368	-54.9		30	12,077	-59.1	24	24	11,663	-54.8		29	11,763	-57.1		24	12,398	-55.0		23	12,326	-56.1				
175----	30	12,988	-60.7		29	13,208	-61.0		30	12,908	-61.8	23	23	12,525	-54.9		29	12,607	-56.9		20	13,231	-61.5		19	13,164	-61.9				
150----	30	13,940	-63.6		29	14,150	-67.1		30	13,856	-63.7	20	20	13,516	-56.5		28	13,585	-57.0		19	14,170	-68.1		10	14,102	-67.8				
125----	30	15,050	-66.3		29	15,234	-72.1		30	14,969	-65.4	15	15	14,678	-56.8		28	14,735	-58.0		12	15,249	-72.6		6	15,208	-72.0				
100----	29	16,393	-68.7		27	16,531	-76.3		30	16,320	-66.8	6	6	16,087	-58.4		28	16,128	-57.7		7	17,829	-76.7								
80----	26	17,730	-67.2		25	17,812	-76.9		28	17,669	-65.2						26	17,534	-57.4												
60----	23	19,476	-62.7		24	19,503	-67.4		25	19,425	-61.9						20	19,350	-56.6												
50----	21	20,601	-60.4		23	20,613	-62.7		21	20,558	-60.0						18	20,508	-56.3												
40----	15	22,003	-58.0		23	22,000	-59.0		19	21,953	-58.6						12	21,936	-56.4												
30----	10	23,829	-54.9		16	23,818	-54.6		13	23,771	-56.5																				
20----	6	26,471	-49.5		6	26,471	-49.5																								

TAMPA, FLA. (1019 MB.)				TATOOSH ISLAND, WASH. (1007 MB.)				VERACRUZ, MEXICO (1015 MB.)				WASHINGTON, D.C. (1011 MB.)																								
Number of observations				Dynamic height				Temperature				Relative humidity				Number of observations				Dynamic height				Temperature				Relative humidity								
SURFACE	30	7	17.6	81	30	31	9.8	83	29	13	24.4	72	30	88	7.4	68	30	174	10.2	59	30	167	18.4	75	30	516	7.3	80	29	586	19.8	73	30	604	9.0	55
1,000----	30	167	18.4	75	30	89	9.2	82	29	145	23.1	73	30	174	10.2	59	30	604	9.0	55	30	609	16.5	72	30	957	4.3	82	29	1,055	17.4	66	30	1,047	6.4	55
950----	30	609	16.5	72	30	516	7.3	80	29	586	19.8	73	30	604	9.0	55	30	1,047	6.4	55	30	1,064	13.8	71	30	1,420	1.2	80	29	1,542	14.6	67	30	1,513	3.7	51
900----	30	1,064	13.8	71	30	957	4.3	82	29	1,055	17.4	66	30	1,047	6.4	55	30	2,003	1.6	45	30	2,048	9.3	57	30	1,905	-1.6	74	29	2,053	12.2	67	30	2,003	1.6	45
850----	30	1,544	11.2	67	30	1,420	1.2	80	29	1,542	14.6	67	30	1,513	3.7	51	30	2,529	-.5	41	30	2,590	7.3	41	30	2,423	-4.1	67	29	2,598	9.9	59	30	2,529	-.5	41
800----	30	2,048	9.3	57	30	1,905	-1.6	74	29	2,053	12.2	67	30	2,003	1.6	45	30	3,070	-3.0	38	30	2,590	7.3	41	30	2,958	-7.0	60	28	3,163	7.1	56	30	3,070	-3.0	38
750----	30	2,590	7.3	41	30	2,423	-4.1	67	29	2,598	9.9	59	30	2,529	-.5	41	30	3,772	4.1	47	30	3,147	4.4	33	30	3,542	-10.4	58	26	3,772	4.1	47	30	3,660	-6.0	35
700----	30	3,147	4.4	33	30	3,542	-10.4	58	26	3,772	4.1	47	30	3,660	-6.0	35	30	4,276	-9.4	33	30	3,756	1.5	35	30	4,145	-13.8	58	26	4,415	-.4	41	30	4,276	-9.4	33
650----	29	4,390	-2.1	32	30	4,145	-13.8	58	26	4,415	-.4	41	30	4,276	-9.4	33	30	4,947	-13.3	32	30	5,082	-6.0		30	4,804	-17.8	55	24	5,103	-3.7	34	30	4,947	-13.3	32
600----	29	5,082	-6.0		30	4,804	-17.8	55	24	5,103	-3.7	34	30	4,947	-13.3	32	30	5,663	-18.1		30	5,817	-10.6		30	5,507	-22.5	53	23	5,854	-8.1		30	5,663	-18.1	
550----	29	5,817	-10.6		30	5,507	-22.5	53	23	5,854	-8.1		30	5,663	-18.1		30	6,450	-23.8		30	6,636	-16.1	37	30	6,280	-28.3	54	21	6,669	-13.5		30	6,450	-23.8	
500----	29	6,636	-16.1	37	30	6,280	-28.3	54	21	6,669	-13.5		30	6,450	-23.8		30	7,291	-29.8		30	7,496	-22.0	36	27	7,110	-34.3	53	19	7,553	-19.4		30	7,291	-29.8	
450----	29	7,496	-22.0	36	27	7,110	-34.3	53	19	7,553	-19.4		30	7,291	-29.8		30	8,230	-36.1		30	8,464	-29.2		27	8,032	-40.5		17	8,537	-25.9		30	8,230	-36.1	
400----	29	8,464	-29.2		27	8,032	-40.5		17	8,537	-25.9		30	8,230	-36.1		30	9,283	-42.9		30	9,546	-37.2		27	9,065	-47.5		15	9,638	-34.2		30	9,283	-42.9	
350----	29	9,546	-37.2		27	9,065	-47.5		15	9,638	-34.2		30	9,283	-42.9		30	10,493	-49.4		30	10,786	-46.8		26	10,257	-53.9		15	10,888	-44.3		30	10,493	-49.4	
300----	29	10,786	-46.8		26	10,257	-53.9		15	10,888	-44.3		30	10,493	-49.4		29	11,933	-54.9		29	12,232	-56.9		24	11,675	-56.6		14	12,343	-55.9		29	11,933	-54.9	
250----	28	10,786	-46.8		24	11,675	-56.6		14	12,343	-55.9		29	11,933	-54.9		28	12,777	-56.6		28	13,067	-61.9		23	12,518	-56.0		10	14,123	-69.5		28	13,751	-57.9	
200----	27	12,232	-56.9		23	12,518	-56.0		10	14,123	-69.5		28	13,751	-57.9		26	14,893	-60.3		26	15,108	-69.0		21	13,491	-55.4		9	15,194	-73.8		26	16,278	-61.9	
175----	27	13,067	-61.9		21	13,491	-55.4		9	15,194	-73.8		26	16,278	-61.9		22	17,668	-62.3		18	19,459	-60.6		20	14,651	-55.3						14	20,599	-60.4	
150----	27	14,010	-66.2		20	14,651	-55.3						18	19,459	-60.6		14	20,599	-60.4		12	21,996	-60.4		16	16,436	-70.6									

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and

expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C. have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.



# PILOT BALLOON DATA

Average monthly resultant winds

Table 21

NOVEMBER 1953

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)			
	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	
	Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction
Surface-----	27	212	2.8	30	203	0.8	29	268	3.1	27	304	2.0	30	124	1.3	30	96	1.4	28	221	3.0	27	220	2.2	27	228	1.1	27	239	2.2	30	263	0.4	30	212	1.6	
500-----	26	220	3.8	29	203	0.8	29	268	3.1	27	304	2.0	30	124	1.3	30	96	1.4	28	221	3.0	27	220	2.2	27	228	1.1	27	239	2.2	30	263	0.4	30	212	1.6	
1,000-----	24	230	5.9	29	203	0.8	29	268	3.1	27	304	2.0	30	124	1.3	30	96	1.4	28	221	3.0	27	220	2.2	27	228	1.1	27	239	2.2	30	263	0.4	30	212	1.6	
1,500-----	23	255	6.4	30	236	1.1	29	261	7.3	22	293	7.6	29	225	3.3	19	266	3.0	15	261	10.0	13	277	5.8	27	268	6.0	22	282	8.4	30	260	1.8	30	216	1.8	
2,000-----	23	263	9.0	28	294	3.5	28	275	7.7	19	284	9.4	28	245	5.3	17	286	4.0	11	262	11.0	13	289	8.7	25	260	6.4	22	282	9.0	30	267	3.1	30	219	3.3	
2,500-----	23	271	10.1	27	293	5.4	28	284	7.8	18	282	9.5	25	250	6.6	16	293	5.2	10	268	12.4	11	281	9.5	25	263	8.2	21	286	8.9	30	283	4.3	28	230	3.3	
3,000-----	20	290	9.7	26	291	8.3	22	282	9.6	15	286	14.2	19	255	8.7	14	304	5.1																			
4,000-----	20	292	10.4	25	295	8.1	17	292	9.1	14	296	15.2	14	255	10.5	13	297	6.2																			
5,000-----	16	314	12.1	24	298	9.4	16	279	9.5	13	281	17.3	13	258	11.3	11	292	5.5																			
6,000-----	14	299	13.1	23	302	12.2																															
8,000-----	12	301	17.4	19	302	14.7																															
10,000-----				14	280	14.1																															
12,000-----																																					
14,000-----																																					

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)			Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Omaha, Nebr. (306 m.)			
	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	
	Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction
Surface-----	29	318	0.1	27	239	3.6	29	253	1.7	30	268	1.7	30	39	2.3	29	262	0.4	26	160	1.6	28	64	3.1	28	24	1.8	28	257	1.2	28	240	1.9	28	220	2.9	
500-----	26	251	6.6	28	257	2.8	30	250	4.1	28	275	5.5	28	262	1.9	26	195	3.0	26	50	2.2	26	307	2.0	27	253	1.7	22	220	1.9	28	254	4.1				
1,000-----	29	287	1.1	21	271	7.8	27	265	5.1	29	251	8.8	25	249	3.1	28	274	4.2	23	209	5.1	24	10	1.2	22	307	3.1	25	297	2.9	21	224	3.3	26	266	5.5	
1,500-----	29	221	1.1	17	263	10.2	26	273	7.1	29	258	10.2	24	259	5.7	25	274	5.3	18	214	6.2	22	287	1.6	18	311	3.6	25	282	5.2	21	226	4.2	25	261	6.3	
2,000-----	28	244	3.0	16	272	10.8	26	270	9.1	28	268	11.2	23	260	6.6	24	284	6.5	15	216	10.2	20	272	3.1	14	305	4.6	23	279	5.5	20	223	5.7	25	273	7.0	
2,500-----	28	256	4.2	16	279	10.9	26	266	10.3	27	270	11.3	21	265	7.3	24	285	7.7	12	217	13.4	19	267	3.9	11	303	5.4	23	281	6.6	18	233	5.9	24	280	7.3	
3,000-----	24	279	7.5	14	283	9.6	24	267	11.5	23	270	11.7	19	261	10.4	19	286	6.8	11	225	16.6	13	269	6.9													
4,000-----	22	283	9.6	10	281	11.9	21	269	13.0	16	275	15.1	17	265	12.4	16	293	8.0																			
5,000-----	19	283	10.9				18	278	13.7	10	278	12.8	14	267	17.3	10	307	8.1																			
6,000-----	14	301	13.8				16	275	15.4																												
8,000-----							12	266	17.7																												
10,000-----																																					
12,000-----																																					
14,000-----																																					
16,000-----																																					

Altitude (meters) m.s.l.	Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (725 m.)			Washington, D. C. (88 m.)								
	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed	No. of observations		Speed
	Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction			Direction		
Surface-----	30	96	0.3	29	264	1.3	26	264	2.1	27	222	1.5	30	15	0.8	30	287	3.1	30	241	1.0	29	197	3.1	25	197	1.8	30	262	0.8						
500-----	30	115	7	29	264	1.3	26	264	2.1	27	222	1.5	30	15	0.8	30	287	3.1	30	241	1.0	29	197	3.1	25	197	1.8	30	262	0.8						
1,000-----	30	120	1.1	29	264	1.3	26	264	2.1	27	222	1.5	30	15	0.8	30	287	3.1	30	241	1.0	29	197	3.1	25	197	1.8	30	262	0.8						
1,500-----	30	167	1.1	27	307	5.4	19	275	7.0	25	247	5.9	26	207	3.1	27	329	9.9	29	262	7.2	21	207	9.8	21	216	6.6	30	274	5.5						
2,000-----	30	219	1.6	27	300	6.7	19	276	7.6	24	255	6.6	22	236	3.9	27	297	1.4	29	270	8.7	16	213	10.1	16	220	9.0	30	269	7.1						
2,500-----	30	260	2.3	27	304	7.8	18	278	9.7	22	259	7.2	21	261	5.0	26	264	1.2	29	269	9.3	11	221	11.0	13	217	10.5	30	262	8.4						
3,000-----	30	253	3.1	26	292	9.3	17	282	9.2	18	287	6.3	21	276	5.9	26	278	2.8	30	272	8.5	11	227	11.2	13	231	11.7	30	261	10.3						
4,000-----	25	289	3.4	23																																

# RAWIN DATA

Average monthly resultant winds

Table 22

NOVEMBER 1953

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			Int. Falls, Minn. (358 m.)			Little Rock, Ark. (80 m.)			
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		
Surface-----	29	83	1.3	30	199	0.3	29	81	1.0	30	46	2.5	29	308	2.3	30	350	0.4	30	214	1.4	30	72	1.7	30	269	0.3	30	304	2.8	30	209	0.6	30	321	0.3	
500-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
1,000-----	---	---	---	29	273	3.6	26	184	1.0	29	79	2.8	29	288	4.4	30	278	1.4	30	255	6.1	---	---	---	29	268	2.2	29	247	2.4	30	261	4.9	30	259	2.1	
1,500-----	---	---	---	29	287	6.0	26	261	1.2	28	105	2.1	28	287	6.8	30	248	2.9	30	271	6.7	30	76	1.5	29	279	3.1	29	252	3.8	28	273	4.6	30	266	3.6	
2,000-----	29	309	1.8	28	290	6.6	27	276	2.2	28	194	.7	28	273	8.5	29	245	3.7	30	279	6.3	30	143	1.1	29	269	4.2	28	265	5.6	28	287	5.7	30	272	4.9	
2,500-----	29	296	4.3	27	280	6.4	28	269	3.0	28	247	2.8	28	271	10.0	29	250	5.3	29	286	6.6	30	199	2.2	29	256	5.7	28	259	7.4	29	286	6.9	29	274	6.6	
3,000-----	29	300	5.4	26	296	8.8	28	279	4.8	27	279	4.7	27	275	11.5	27	246	6.3	29	283	6.9	30	233	4.0	28	251	7.5	28	258	9.4	29	287	6.8	28	284	6.6	
4,000-----	28	307	7.0	25	291	9.8	28	287	6.8	27	269	7.9	26	275	13.5	27	247	9.5	28	275	7.8	30	274	6.0	29	255	9.8	28	251	12.2	28	292	7.1	25	294	7.3	
5,000-----	26	288	6.4	25	284	12.5	27	268	7.7	27	264	10.6	24	280	16.5	26	246	11.1	28	280	9.2	30	277	8.6	28	256	13.7	27	252	14.2	26	300	9.3	26	294	9.0	
6,000-----	24	289	9.7	24	295	13.5	25	263	9.4	26	265	13.4	22	273	16.7	26	248	13.4	26	299	12.7	29	287	11.8	26	254	14.7	25	253	15.6	26	317	11.2	23	298	9.3	
8,000-----	19	297	9.1	19	287	17.0	21	269	14.9	25	259	18.8	19	279	20.2	23	264	17.6	22	300	12.7	26	292	12.0	24	255	15.4	18	272	15.2	20	318	14.3	17	284	10.0	
10,000-----	16	310	11.2	14	276	20.5	17	273	19.5	22	256	23.3	16	268	26.2	17	263	21.7	20	291	16.7	21	285	13.2	20	262	18.9	16	266	20.6	17	333	18.3	13	286	10.7	
12,000-----	15	313	15.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14,000-----	11	310	10.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
16,000-----	11	297	8.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
18,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
20,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	

Altitude (meters) m.s.l.	Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma, City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P.R. (28 m.)			Santa Maria, Calif. (72 m.)			
	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		
Surface-----	30	147	1.2	30	26	2.5	29	139	2.0	28	270	1.3	30	243	0.7	29	254	0.2	30	162	2.5	30	295	1.4	29	282	1.0	30	41	1.3	30	145	1.7	30	39	1.1	
500-----	30	149	1.8	30	71	4.8	---	---	---	25	260	4.5	29	232	1.3	29	275	1.5	29	177	3.1	---	---	---	29	255	2.0	30	87	2.6	30	82	4.3	30	24	2.1	
1,000-----	30	173	3.7	30	79	3.9	29	166	3.3	24	278	5.3	29	241	1.9	29	248	2.2	29	208	4.3	28	258	1.2	29	271	3.7	30	163	.8	30	80	4.0	29	32	1.2	
1,500-----	30	203	5.6	30	94	2.3	29	227	4.1	25	269	5.5	29	261	3.5	29	248	2.7	27	256	3.4	28	278	4.2	29	275	4.5	30	255	1.5	30	78	3.5	29	353	.5	
2,000-----	30	218	7.8	30	180	1.0	29	273	4.7	25	267	6.9	29	265	4.5	29	253	3.9	27	280	3.9	29	293	5.9	29	289	5.4	30	269	3.2	30	76	2.9	29	290	2.3	
2,500-----	29	230	9.6	36	251	2.8	29	292	5.5	26	261	9.1	29	276	5.6	29	257	5.9	27	276	4.4	28	309	7.8	29	295	6.3	30	281	4.6	30	74	2.9	30	284	4.5	
3,000-----	29	229	12.4	30	249	4.0	29	292	6.5	26	258	10.7	29	271	6.8	29	258	7.4	28	278	5.9	28	307	9.4	29	290	7.6	30	280	5.2	30	71	2.5	30	280	5.3	
4,000-----	28	240	13.0	30	254	6.6	29	295	7.8	25	257	13.4	29	269	9.8	29	270	9.9	28	288	8.6	28	307	11.6	26	292	7.9	30	277	7.7	30	39	1.7	29	262	8.6	
5,000-----	27	253	14.2	30	258	8.9	27	289	8.1	22	253	15.0	30	268	11.7	28	262	12.9	26	294	9.5	26	296	12.2	26	295	9.4	30	279	10.3	29	29	2.1	27	266	10.5	
6,000-----	24	260	17.0	28	265	10.7	24	301	10.7	21	257	15.3	27	261	10.6	24	258	12.8	24	280	9.3	25	290	12.8	23	284	9.1	28	276	10.4	29	13	2.8	26	265	12.1	
8,000-----	15	255	21.0	28	268	18.3	19	289	13.3	18	266	19.9	25	269	15.2	19	269	16.0	21	292	13.5	21	275	13.4	23	287	10.8	25	278	12.9	29	323	5.7	24	263	14.6	
10,000-----	---	---	---	26	269	24.5	17	290	14.6	11	251	17.3	20	275	17.4	14	270	19.1	17	292	13.2	18	263	12.8	22	286	14.9	19	278	13.8	29	322	10.2	19	262	16.0	
12,000-----	---	---	---	21	261	31.1	12	289	13.7	---	---	---	17	265	16.6	12	263	25.2	16	300	13.7	14	280	17.2	18	286	12.3	16	275	18.0	29	303	17.0	14	272	19.8	
14,000-----	---	---	---	14	273	30.9	10	307	11.8	---	---	---	13	273	14.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
16,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
18,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
20,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
22,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
24,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D. C. (88 m.)		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed	
Surface-----	30	79	0.4	30	187	1.2	28	146	3.7	30	223	0.4
500-----	30	249	1.9	---	---	---	28	186	7.4	30	260	3.6
1,000-----	30	261	6.0	30	202	4.2	25	199	9.3	30	272	5.1
1,500-----	30	279	6.0	29	225	6.4	25	207	9.9	30	268	5.0
2,000-----	30	282	6.3	28	237	7.1	24	218	11.1	30	283	5.6
2,500-----	30	276	6.2	27	245	7.7	23	219	11.6	30	255	6.3
3,000-----	30	281	7.0	27	251	10.0	23	227	12.9	30	254	8.0
4,000-----	30	279	8.2	24	249	11.2	22	239	15.8	30	248	12.3
5,000-----	30	279	9.1	23	253	14.3	21	248	18.0	30	248	14.9
6,000-----	30	279	9.2	18								



# SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langleys per minute on a surface normal to the direction of the sun.

NOVEMBER 1953

Sun's zenith distance									
Date	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
TABLE MOUNTAIN, CALIF.									
Air mass									
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76
Nov. 3-----	1.11	1.21	1.31	1.46	-----	-----	-----	-----	-----
11-----	-----	1.18	1.28	1.42	-----	-----	-----	-----	-----
16-----	-----	-----	-----	1.45	-----	-----	-----	-----	-----
19-----	1.12	1.21	1.31	1.46	-----	-----	-----	-----	-----
23-----	-----	-----	-----	1.47	-----	-----	-----	-----	-----
24-----	1.17	1.27	1.37	1.49	-----	-----	-----	-----	-----
25-----	1.17	1.27	1.38	1.50	-----	-----	-----	-----	-----
28-----	-----	-----	-----	1.46	-----	-----	-----	-----	-----
29-----	-----	-----	-----	1.50	-----	-----	-----	-----	-----
Aver-ages	1.11	1.23	1.33	1.47	-----	-----	-----	-----	-----
Departures	-.06	-.04	-.04	-.05	-----	-----	-----	-----	-----
BLUE HILL, MASS.									
Air mass									
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86
Nov. 5-----	-----	-----	1.16	-----	-----	-----	-----	-----	-----
9-----	0.58	0.70	.86	1.06	-----	-----	-----	-----	-----
16-----	-----	.74	.98	-----	-----	0.97	0.89	0.80	-----
18-----	.05	.95	1.08	-----	-----	.97	.81	.60	-----
19-----	.70	.80	.93	-----	-----	.78	.62	.51	-----
20-----	.56	.66	.87	-----	-----	.80	.71	.60	-----
27-----	-----	-----	1.04	-----	-----	-----	-----	-----	-----
29-----	.53	.70	.94	-----	-----	1.10	1.00	.94	-----
Aver-ages	.61	.76	.98	(1.06)	-----	.94	.81	.71	-----
Departures	-.23	.21	-.08	(-.21)	-----	-.14	-.13	-.12	-----
BOSTON, MASS.									
Air mass									
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
NO DATA DURING NOVEMBER 1953									
MADISON, WIS.									
Air mass									
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
NO DATA DURING NOVEMBER 1953									

Sun's zenith distance									
Date	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
ALBUQUERQUE, N. MEX.									
Air mass									
	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08
Nov. 1-----	-----	-----	1.19	1.36	-----	1.33	-----	-----	-----
2-----	-----	-----	-----	1.32	-----	1.40	-----	-----	-----
3-----	-----	-----	-----	-----	-----	1.17	-----	-----	-----
4-----	0.86	-----	-----	-----	-----	-----	-----	-----	-----
6-----	-----	-----	1.11	1.26	-----	-----	1.11	0.97	-----
7-----	1.01	1.12	1.24	1.38	-----	1.36	1.21	1.10	0.99
8-----	.99	1.10	1.23	1.38	-----	1.37	1.20	1.07	.98
9-----	-----	-----	-----	-----	-----	1.38	1.24	1.11	1.02
11-----	1.02	1.14	1.26	1.40	-----	1.40	1.22	1.11	1.01
12-----	1.02	1.14	1.25	1.39	-----	1.40	1.21	1.12	.98
13-----	.98	1.08	1.19	1.37	-----	1.34	1.19	1.06	.92
14-----	.96	1.05	1.16	1.36	-----	1.36	1.16	-----	-----
15-----	.90	1.02	1.15	1.33	-----	1.30	1.15	1.01	.89
16-----	.94	1.05	1.16	1.34	-----	1.30	1.15	1.02	.91
17-----	.92	1.05	1.16	1.34	-----	1.31	1.06	.89	.73
18-----	-----	1.04	1.17	-----	-----	-----	-----	-----	-----
20-----	1.00	-----	-----	1.38	-----	-----	1.18	1.04	-----
22-----	.99	1.11	1.23	-----	-----	-----	-----	-----	-----
23-----	.94	1.07	1.19	1.40	-----	1.38	1.25	1.14	1.04
24-----	1.01	1.11	1.22	-----	-----	1.38	1.24	1.12	1.01
25-----	1.02	1.12	1.23	1.37	-----	1.38	1.23	1.05	.93
26-----	1.03	1.13	1.26	1.41	-----	-----	-----	-----	-----
28-----	1.03	1.13	1.25	1.38	-----	1.42	1.25	1.14	1.00
29-----	-----	-----	1.24	1.38	-----	-----	-----	-----	-----
30-----	1.03	1.10	1.24	1.39	-----	1.43	1.28	1.16	1.06
Aver-ages	.98	1.09	1.21	1.37	-----	1.37	1.20	1.07	.96
Departures	-.03	-.03	-.03	-.01	-----	-.02	-.03	-.04	-.05
LINCOLN, NEBR.									
Air mass									
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77
Nov. 2-----	0.77	0.86	1.01	1.17	-----	-----	-----	-----	-----
5-----	.79	.92	1.05	1.24	-----	1.24	1.05	0.94	0.81
13-----	.60	.77	.96	1.18	-----	1.18	1.01	.84	.73
14-----	-----	-----	.99	1.18	-----	1.18	1.07	.94	.83
16-----	.68	.81	.96	1.18	-----	1.18	.98	.81	.70
24-----	.61	.92	1.07	-----	-----	-----	1.09	.96	.85
30-----	.86	.99	1.12	-----	-----	-----	1.09	1.01	.90
Aver-ages	.75	.88	1.02	1.19	-----	1.19	1.05	.92	.80
Departures	-.14	-.12	-.13	-.15	-----	-.13	-.10	-.11	-.10
* Extrapolated									

\* Extrapolated

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of

pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

# SOLAR RADIATION DATA

NOVEMBER 195

**Table 31a** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass., during the month

								Avg										Avg									Avg
Date-----	5	6	7	8	9	10	11		12	13	14	15	16	17	18			19	20	21	22	23	24	25			
Langley's --	77	31	14	64	70	75	54	55	34	69	79	61	66	83	59	67	61	50	75	53	7	61	16			47	
Date-----	26	27	28	29	30	1	2																				
Langley's-----	65	50	21	66	35	25	61	52																			

**Table 31b** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass., during the month

								Avg										Avg										Avg
Date	5	6	7	8	9	10	11		12	13	14	15	16	17	18			19	20	21	22	23	24	25				
Langley's	229	20	23	121	295	76	46	119	26	165	134	75	207	113	190	140	176	167	167	41	7	124	10			98		
Date	26	27	28	29	30	1	2																					
Langley's	193	164	23	152	127	16	161	117																				

**Table 31c** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass., during the month

	Avg										Avg										Avg			
Date	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25	
Langley's	500	24	16	115	144	191	50	208	26	170	326	169	480	264	474	317	415	442	263	43	6	318	12	215
Date	26	27	28	29	30	1	2																	
Langley's	521	444	21	175	232	17	500	376																

**Table 31d** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass., during the month

								Avg										Avg									Avg
Date - - - - -	5	6	7	8	9	10	11		12	13	14	15	16	17	18			19	20	21	22	23	24	25			
Langley's - -	187	24	20	120	168	81	47	92	27	132	69	107	175	134	161	115	147	176	80	41	5	126	9			78	
Date - - - - -	26	27	28	29	30	1	2																				
Langley's - - -	172	126	19	169	59	52	172	104																			

**Table 31e** Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass., during the month

								Avg									Avg										Avg
Date-----	5	6	7	8	9	10	11		12	13	14	15	16	17	18			19	20	21	22	23	24	25			
Langleys---	66	35	27	86	99	110	70	71	39	58	71	73	49	102	40	62	53	46	92	57	5	59	13			46	
Date-----	26	27	28	29	30	1	2																				
Langleys---	62	40	32	42	67	16	40	13																			

Note: Langley is the unit used to denote one gram calorie per square centimeter



# SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langley's,

[illegible]

Accumulated Departures January 1 to December 2, 1953

Note.--Langley is the unit used to denote one gram calorie per square centimeter.

Values in parentheses are interpolated.

\* sun below horizon after 19th.

SOCIAL RADIATION DATA

# SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langley's.—Continued

NOVEMBER 1953

1953	Lander, Wyo.	Las Vegas, Nevada	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBGO)	Medford, Ore.	Miami, Fla.	Midland, Texas	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Portland, Me.	Prosser 4 NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	San Antonio, Texas	San Jose, Calif.	Saville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (U. of W.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Is., W. I.	Tampa, Fla.	Toronto, Ontario	Upton, N. Y.	Washington, D. C. (Silver Hill Obs.)	Winnipeg, Manitoba		
Nov. 5-----	218	387	322	373	327	235	158	331	---	356	303	256	97	159	(284)	290	398	159	60	208	318	327	298	164	247	158	162	287	282	467	175	270	310	190	221		
Nov. 6-----	164	366	89	348	422	247	207	426	---	357	41	23	248	133	285	403	266	241	38	208	171	366	14	157	40	87	70	87	90	494	156	272	32	49	210		
Nov. 7-----	336	400	42	188	470	387	260	334	---	358	97	38	288	78	30	398	320	179	285	417	305	407	162	299	273	322	134	140	139	173	295	362	89	62	330	58	
Nov. 8-----	332	401	214	265	425	377	161	289	---	318	174	268	350	93	45	388	320	179	285	417	305	407	162	299	273	322	134	140	139	173	295	362	89	62	330	58	
Nov. 9-----	310	338	168	350	289	277	225	285	---	319	276	250	336	403	(108)	394	320	179	285	417	305	407	162	299	273	322	134	140	139	173	295	362	89	62	330	58	
Nov. 10-----	246	358	223	355	296	235	80	135	---	317	102	105	264	372	(99)	224	282	51	194	248	498	466	365	201	228	279	158	162	287	282	467	175	270	310	190	221	
Nov. 11-----	289	360	332	334	371	346	---	104	---	331	218	260	266	355	38	385	315	63	217	358	466	365	201	228	279	158	162	287	282	467	175	270	310	190	221		
Averages-----	269	361	184	318	364	315	182	272	---	332	173	171	254	228	(127)	368	277	147	188	336	336	(309)	163	162	212	82	80	207	259	335	258	153	181	242	122	---	
Departures-----	---	---	---	---	---	---	---	---	---	-107	-24	-10	---	---	---	---	---	---	---	+33	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Nov. 12-----	284	351	192	345	114	168	134	105	---	329	80	169	290	333	199	381	253	184	275	349	464	333	177	154	192	170	129	129	213	374	(166)	340	24	(190)	259	179	
Nov. 13-----	278	355	226	335	255	299	118	323	---	327	246	184	240	369	44	367	307	121	269	366	464	253	214	81	210	42	50	68	395	193	389	46	230	239	124	---	
Nov. 14-----	254	122	251	339	29	55	186	315	---	281	137	8	268	371	(92)	358	154	135	261	104	466	290	21	43	152	67	64	156	382	56	420	165	49	209	147	---	
Nov. 15-----	278	351	252	330	396	340	235	245	---	280	189	207	266	356	---	310	---	173	244	371	393	377	201	169	202	85	41	230	367	298	433	205	212	272	150	---	
Nov. 16-----	287	354	243	330	389	345	47	184	---	282	258	238	279	286	(117)	372	322	42	262	368	294	368	242	158	233	41	46	242	336	(253)	369	65	254	342	172	---	
Nov. 17-----	254	339	233	289	350	282	175	375	---	256	231	235	276	254	(209)	231	---	110	257	192	261	367	223	195	238	112	113	239	231	499	398	180	234	348	148	---	
Nov. 18-----	135	361	163	168	404	362	99	286	---	195	253	188	225	155	181	291	301	188	38	378	224	374	218	181	230	72	98	230	104	462	370	164	231	309	72	---	
Averages-----	253	319	223	305	277	263	142	262	---	274	199	175	263	303	(141)	330	268	136	230	304	366	338	185	140	208	84	77	135	313	(275)	388	121	(200)	283	142	---	
Departures-----	---	---	---	---	---	---	---	---	---	+50	+16	+24	---	---	---	---	---	---	---	+28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Nov. 19-----	307	364	90	69	367	336	47	267	---	313	250	212	167	262	---	(139)	385	257	112	193	378	331	350	186	203	43	34	204	31	448	355	119	220	289	148	---	
Nov. 20-----	282	168	68	361	382	355	149	299	---	372	78	224	151	71	285	---	142	333	237	151	161	334	470	368	172	182	128	127	224	160	429	293	105	189	323	52	---
Nov. 21-----	310	346	149	240	317	(277)	101	404	---	316	295	182	130	183	220	40	362	230	80	169	324	178	325	150	117	125	19	13	151	122	489	380	58	175	133	52	---
Nov. 22-----	261	233	228	145	319	(258)	12	356	---	382	104	112	67	63	359	(74)	316	182	29	135	300	469	294	137	128	181	117	84	70	405	344	193	186	148	151	48	---
Nov. 23-----	183	338	159	269	319	(307)	25	226	---	343	124	8	15	290	276	174	362	141	210	160	331	465	356	0	34	26	118	125	137	310	440	163	184	151	48	---	
Nov. 24-----	238	329	239	230	354	324	103	341	---	374	79	188	134	72	347	(123)	356	283	79	129	344	466	353	117	136	149	53	14	133	342	495	214	50	149	89	53	---
Nov. 25-----	241	327	110	331	366	328	133	292	---	368	252	20	28	101	345	128	359	123	116	228	359	466	353	6	25	34	24	15	34	359	461	450	85	32	65	130	---
Averages-----	262	301	136	235	346	(312)	82	312	---	352	135	99	149	306	(103)	353	208	111	168	341	404	348	110	113	135	72	64	145	247	465	292	98	132	172	77	---	
Departures-----	---	---	---	---	---	---	---	---	---	47	-17	-40	---	---	---	---	---	---	---	---	+64	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nov. 26-----	172	275	185	327	285	(241)	86	273	---	377	166	247	205	131	335	(103)	335	277	43	253	268	450	167	240	135	237	71	91	119	284	312	440	61	240	291	81	---
Nov. 27-----	131	229	168	116	304	(285)	105	436	---	314	264	230	85	198	226	(108)	188	266	180	234	262	494	309	183	166	112	154	120	74	212	274	381	47	200	70	63	---
Nov. 28-----	210	325	144	193	347	(303)	117	400	---	273	294	88	160	293	219	(69)	337	165	73	228	338	160	342	98	136	100	49	33	140	263	445	154	105	159	48	---	
Nov. 29-----	218	327	161	257	367	323	55	310	---	318	136	245	223	175	315	(51)	356	183	81	224	353	203	342	208	177	222	47	39	202	278	365	430	65	228	293	129	---
Nov. 30-----	226	270	224	283	344	277	117	312	---	312	254	135	137	63	158	316	83	351	151	150	323	182	268	54	56	107	21	74	41	329	320	410	17	73	236	148	---
Dec. 1-----	147	278	52	281	198	161	137	272	---	338	272	47	52	271	81	71	210	216	159	53	236	221	303	16	110	134	68	48	79	56	309	401	129	43	144	166	---
Dec. 2-----	238	300	28	51	319	275	101	318	---	389	228	231	213	216	56	(93)	342	256	185	166	311	310	324	222	85	234	81	75	237	31	370	401	117	224	324	50	---
Averages-----	193	285	137	215	309	(267)	102	332	---	280	214	175	143	206	221	(97)	303	228	125	183	299	288	296	146	124	164	70	69	127	207	299	411	84	159	217	91	---
Departures-----	---	---	---	---	---	---	---	---	---	47	+20	+13	---	---	---	---	---	---	---	---	+42	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Accumulated Departures January 1 to December 2, 1953

-7064

-22757

Note.—Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.



## ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

NOVEMBER 1953

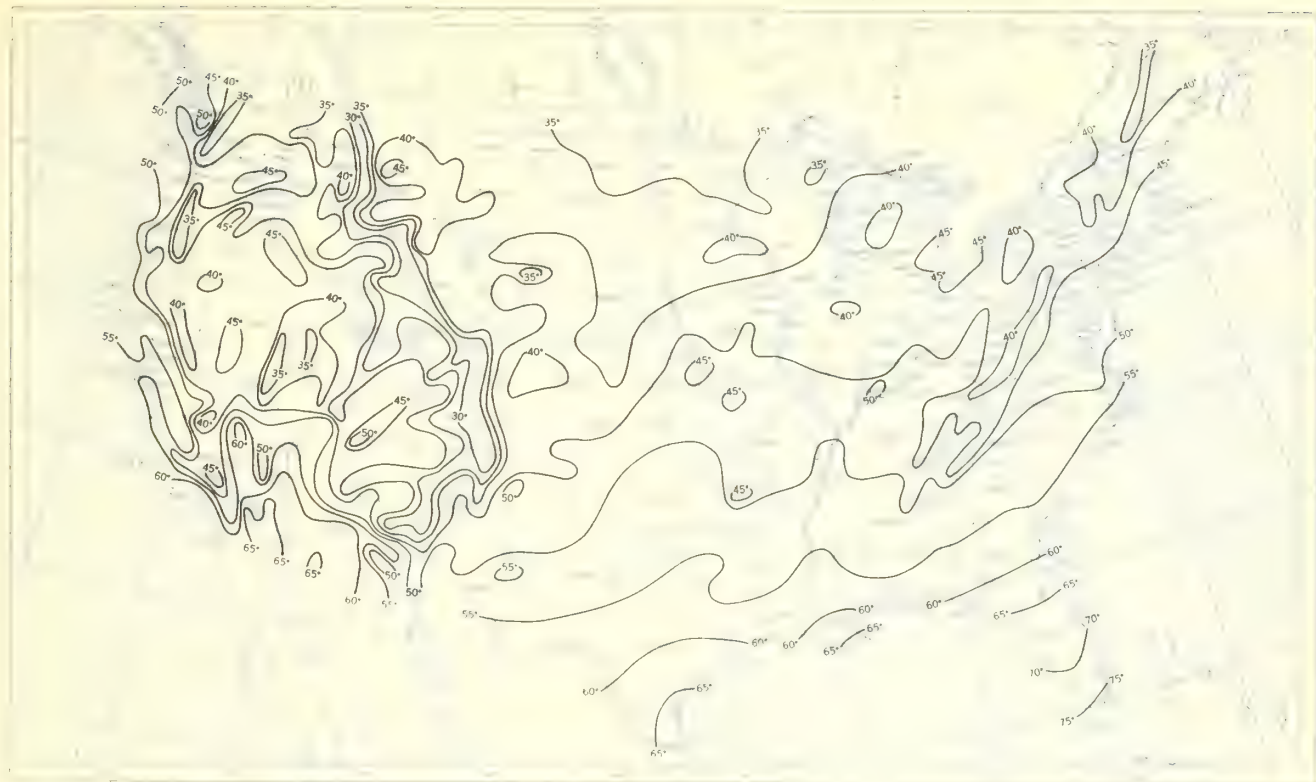
Station	Day of month																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
Baltimore, Md.-----	312	369	350	234	204	69	---	360	340	183	304	236	214	54	252	280	280	237	212	228	105	100	90	87	50	226	75	128	252	210		208
Philadelphia, Pa.-----	249	291	267	216	260	20	117	336	284	130	270	130	148	45	188	198	213	164	123	136	100	90	15	---	20	224	69	93	190	108		162

The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continu-

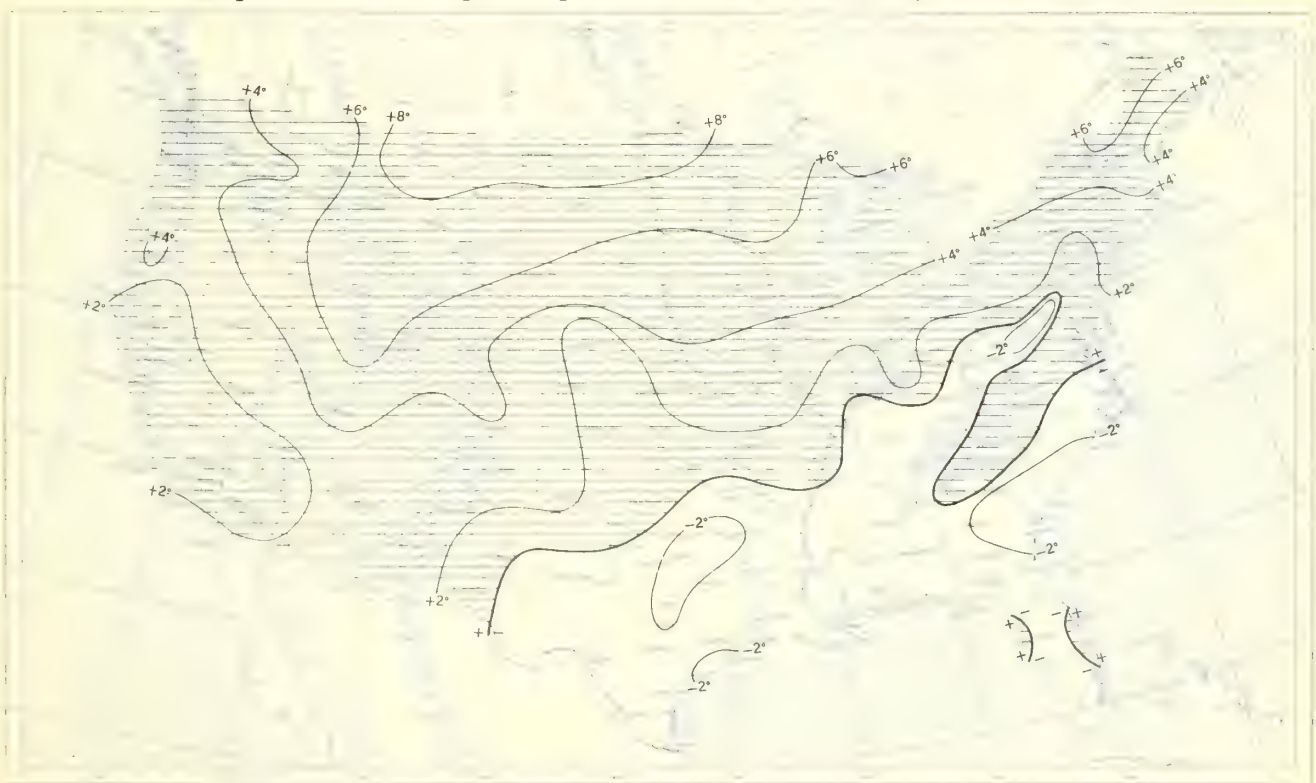
ous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in Illuminating Engineering, Vol. XLVI No. 2, pages 59 to 62.

NWRC, Asheville, N.C. --- 2/12/54 --- 2000

Chart I. A. Average Temperature ( $^{\circ}\text{F.}$ ) at Surface, November 1953.



B. Departure of Average Temperature from Normal ( $^{\circ}\text{F.}$ ), November 1953.



A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

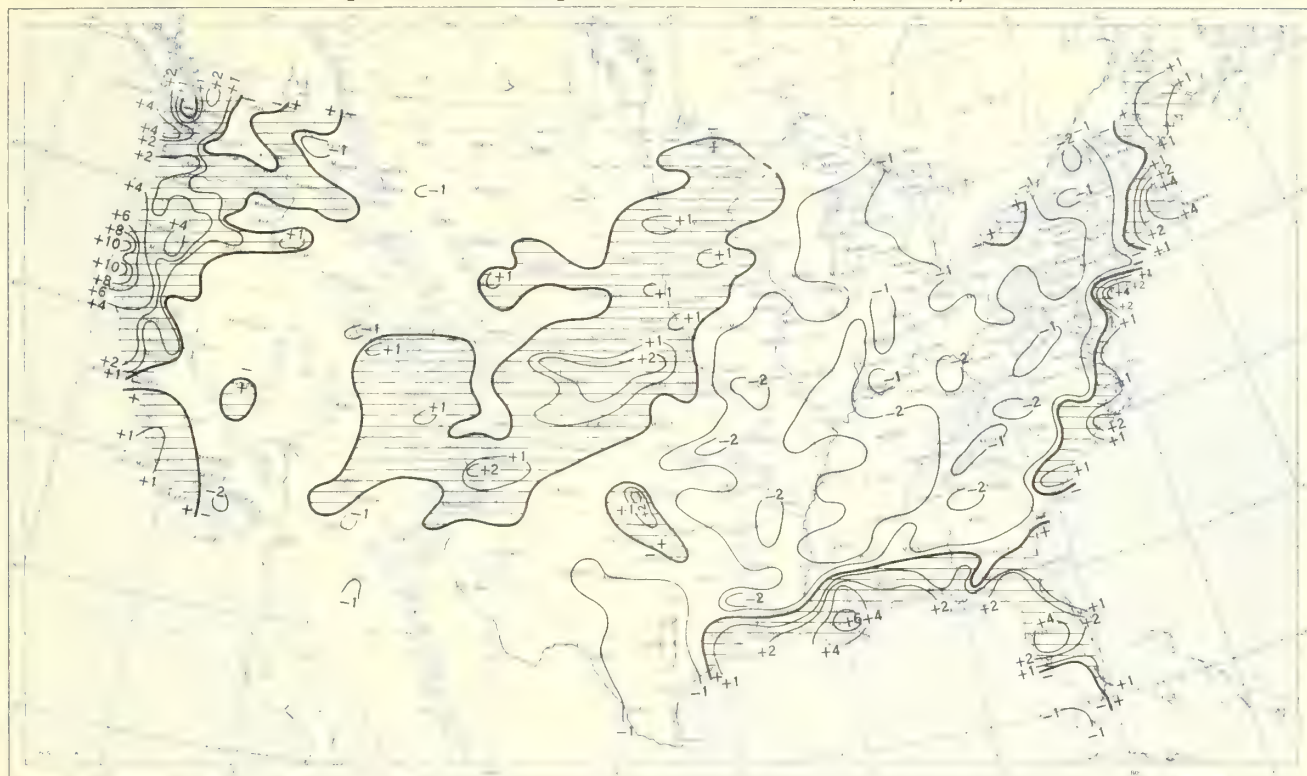


Chart II. Total Precipitation (Inches), November 1953.

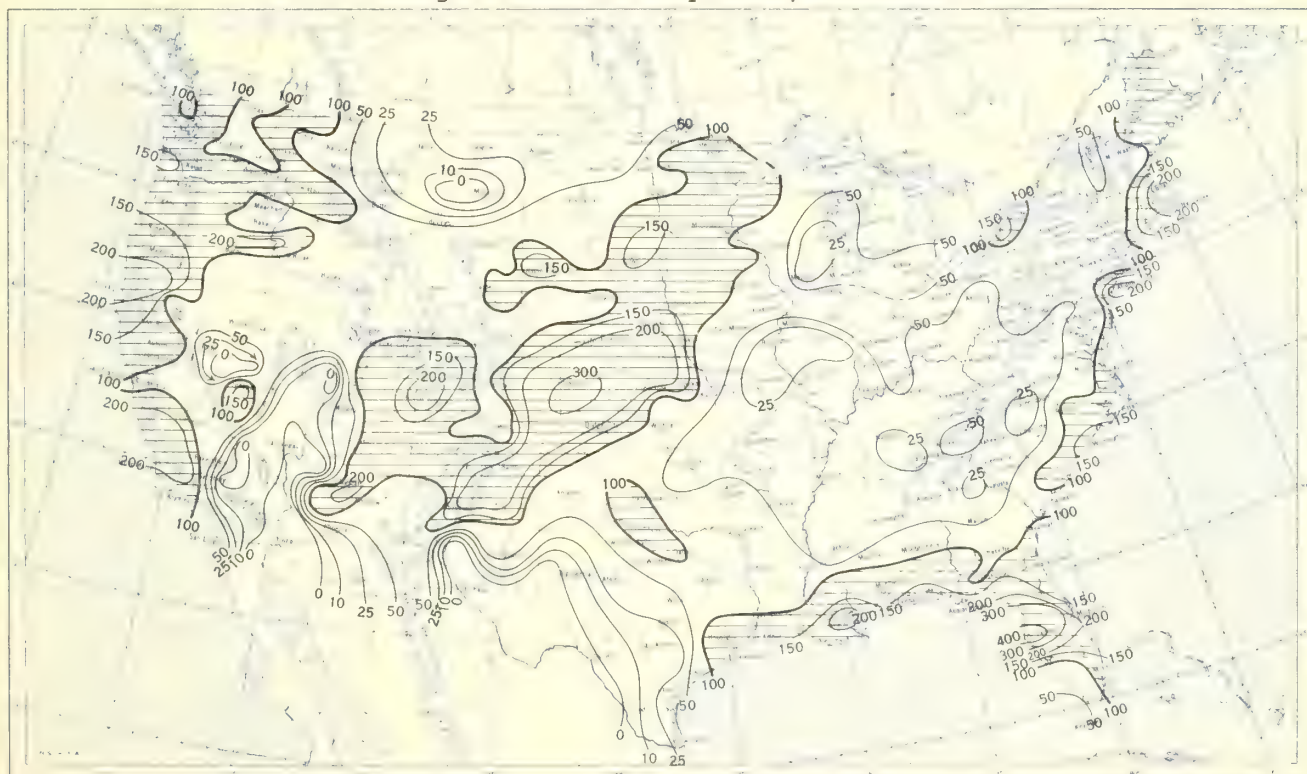


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), November 1953.



B. Percentage of Normal Precipitation, November 1953.



Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

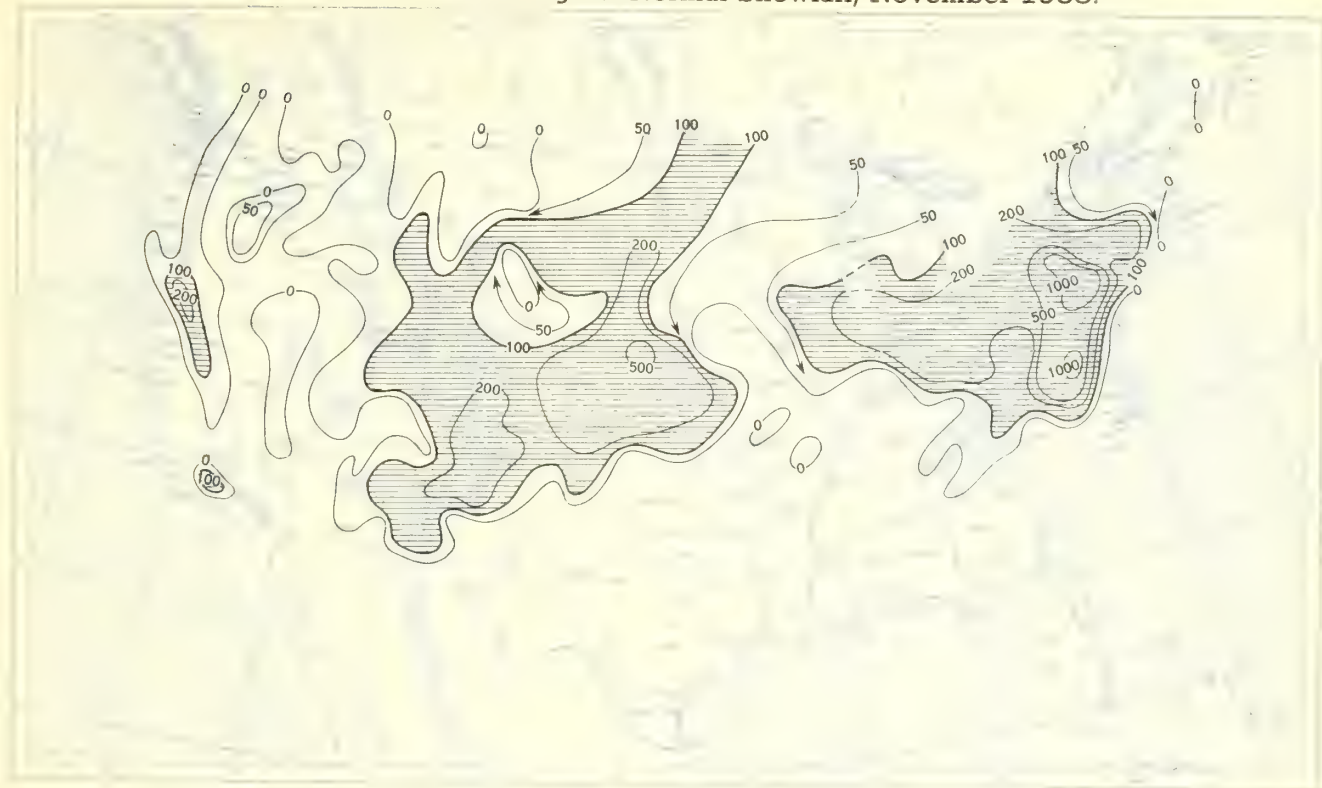


Chart IV. Total Snowfall (Inches), November 1953.



This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, November 1953.



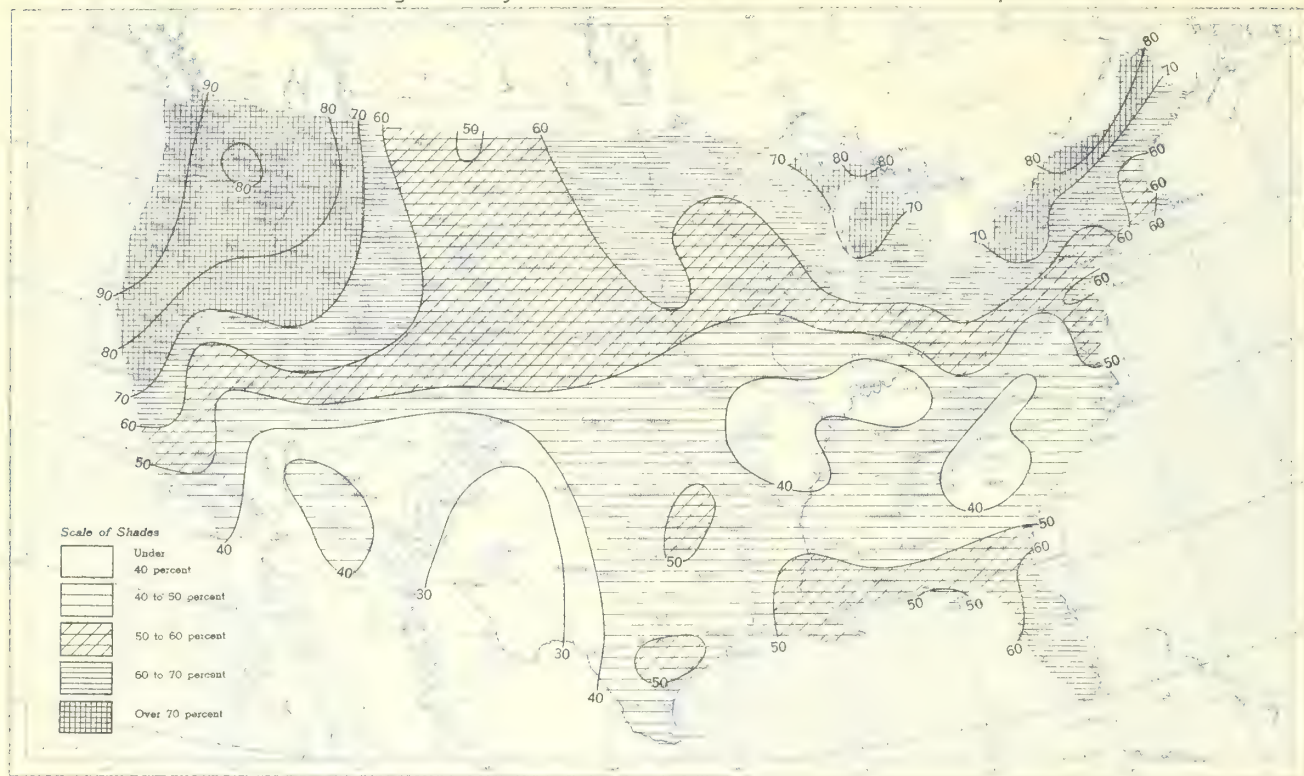
B. Depth of Snow on Ground (Inches)



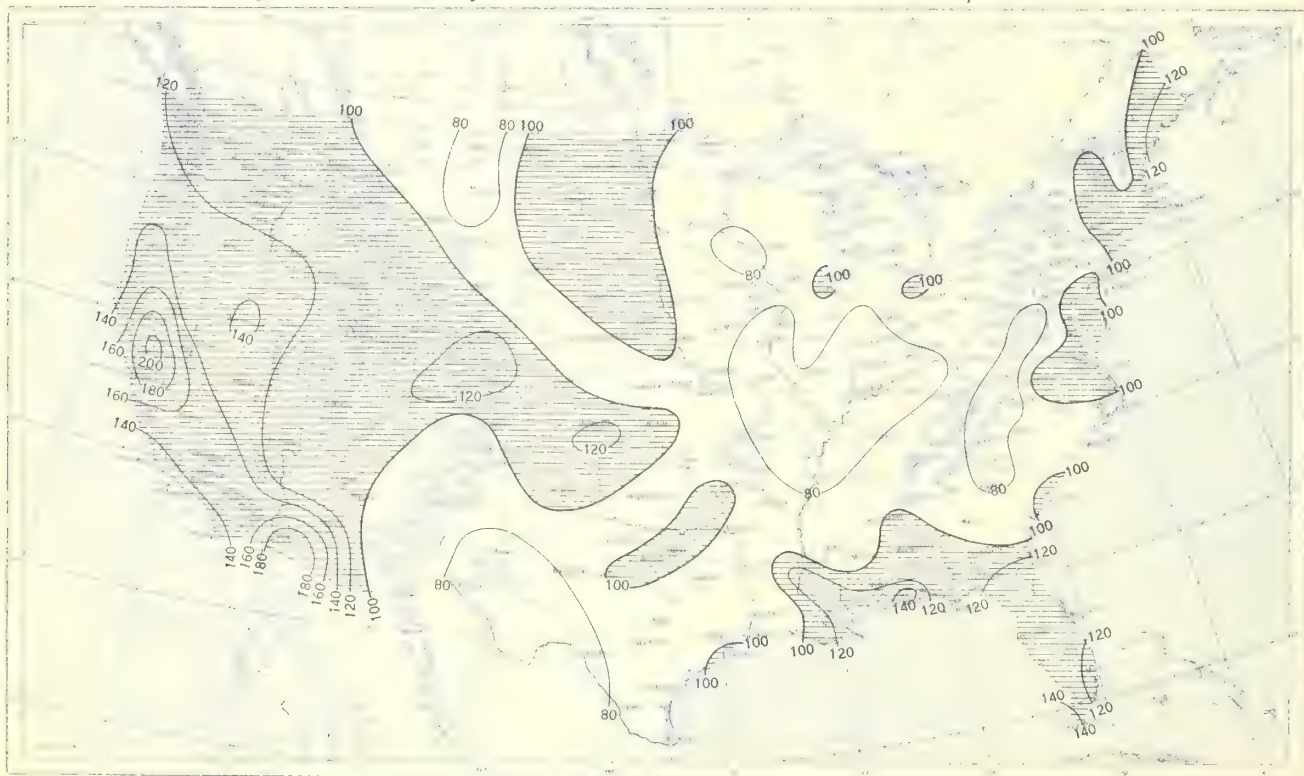
A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.  
 B. Shows depth currently on ground at 7:30 a.m. E.S.T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.



Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, November 1953.



B. Percentage of Normal Sky Cover Between Sunrise and Sunset, November 1953.

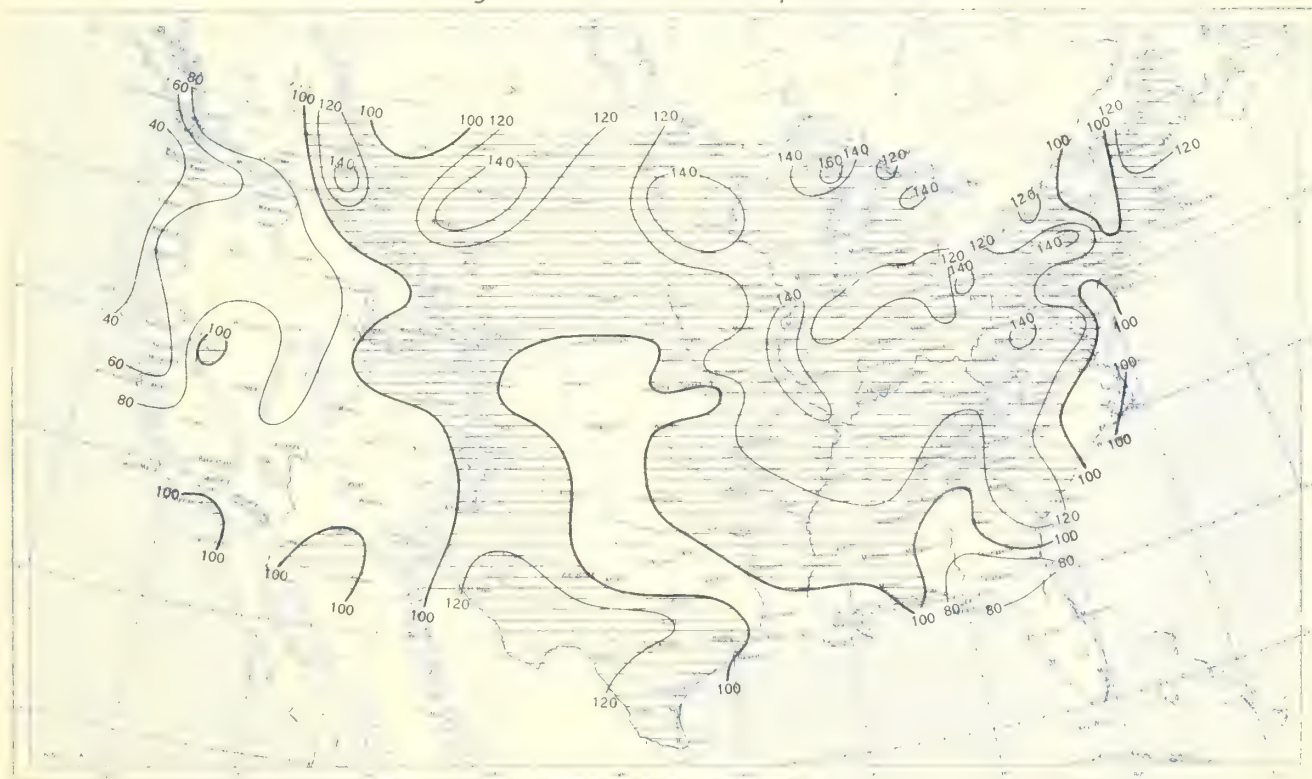


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, November 1953.



B. Percentage of Normal Sunshine, November 1953.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.



Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, November 1953. Inset: Percentage of Normal Average Daily Solar Radiation, November 1953.

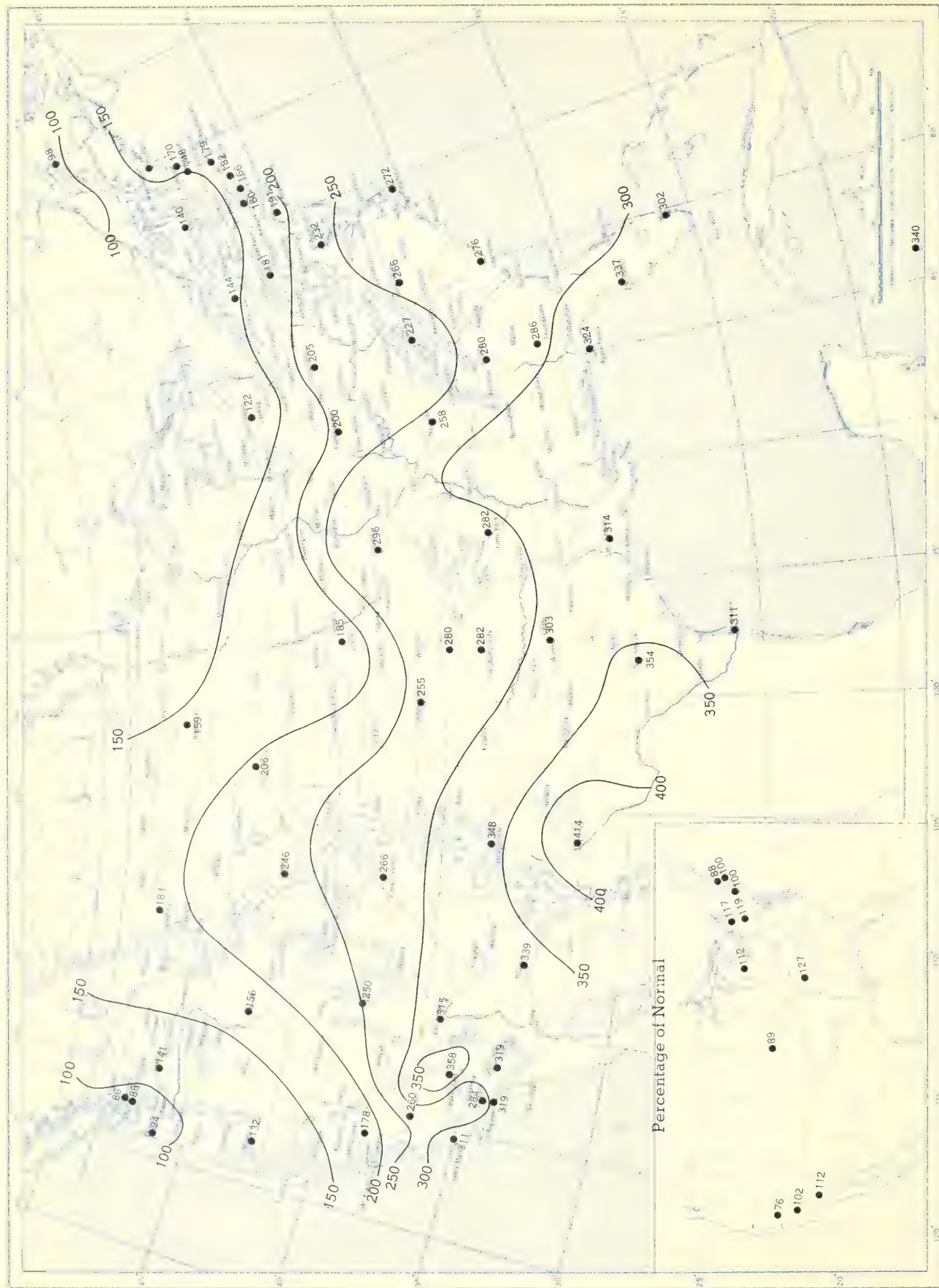
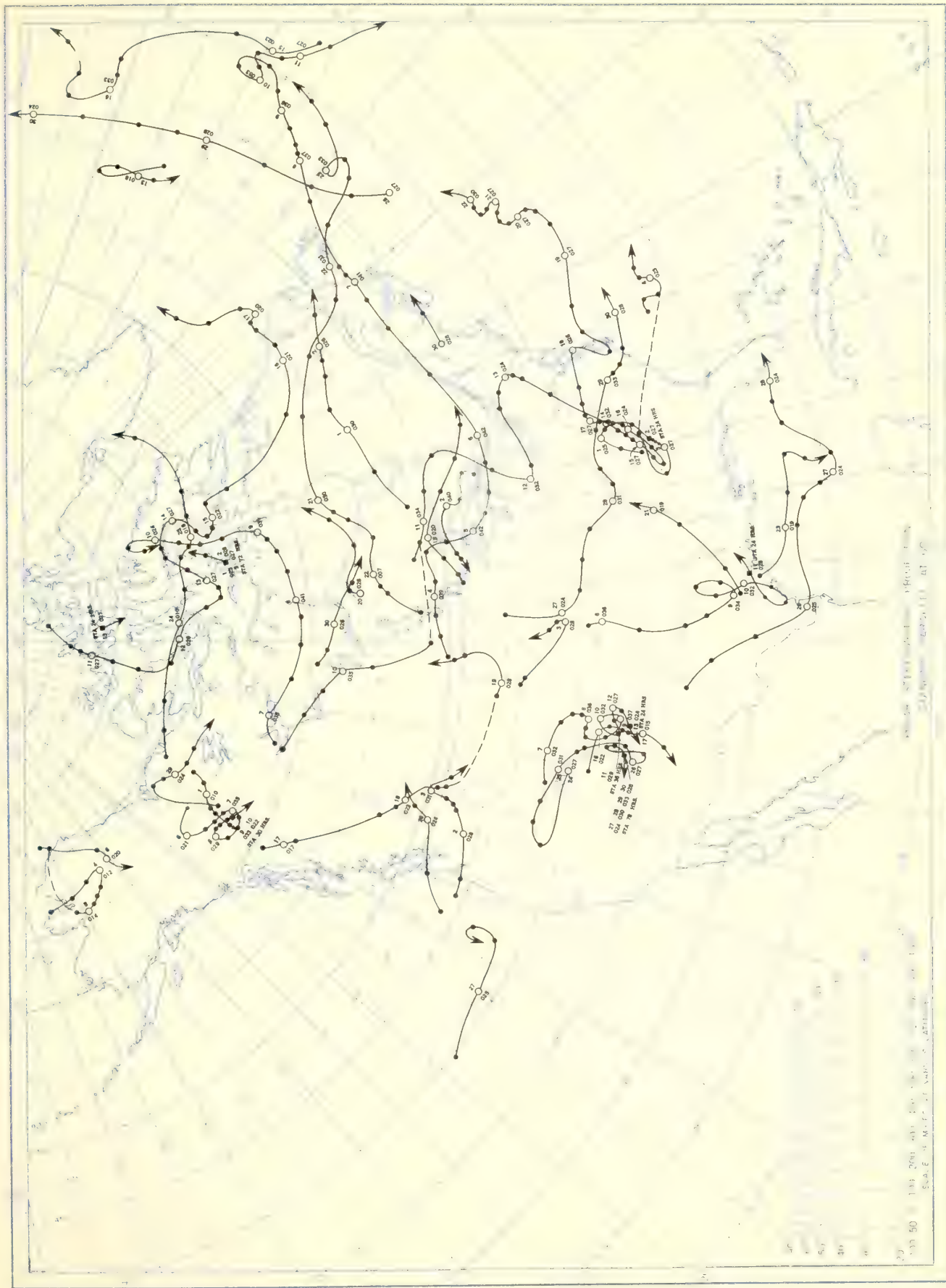


Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.<sup>-2</sup>). Basic data for isohyets are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 4 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, November 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar.  
 Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.



Chart X. Tracks of Centers of Cyclones at Sea Level, November 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

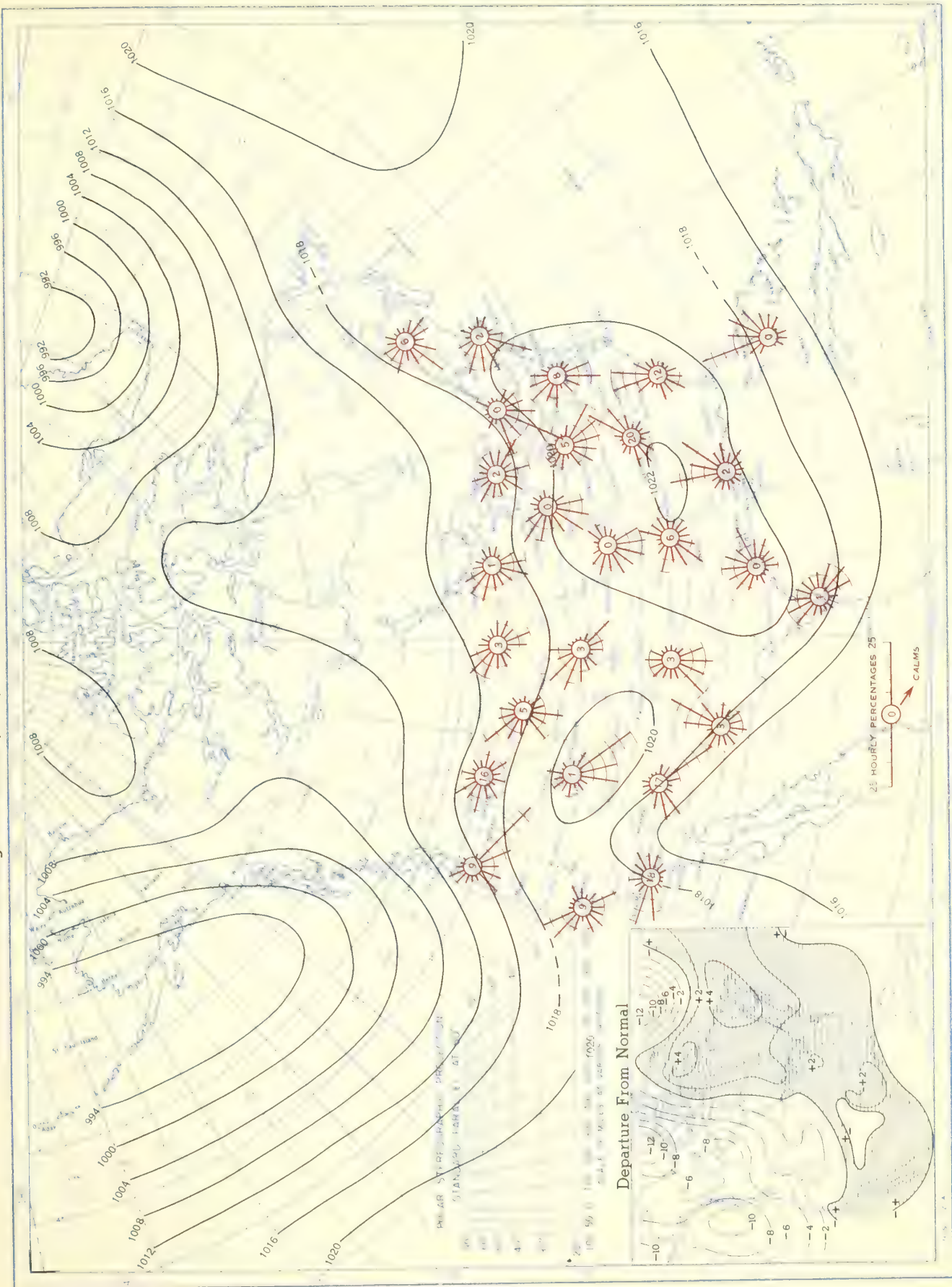
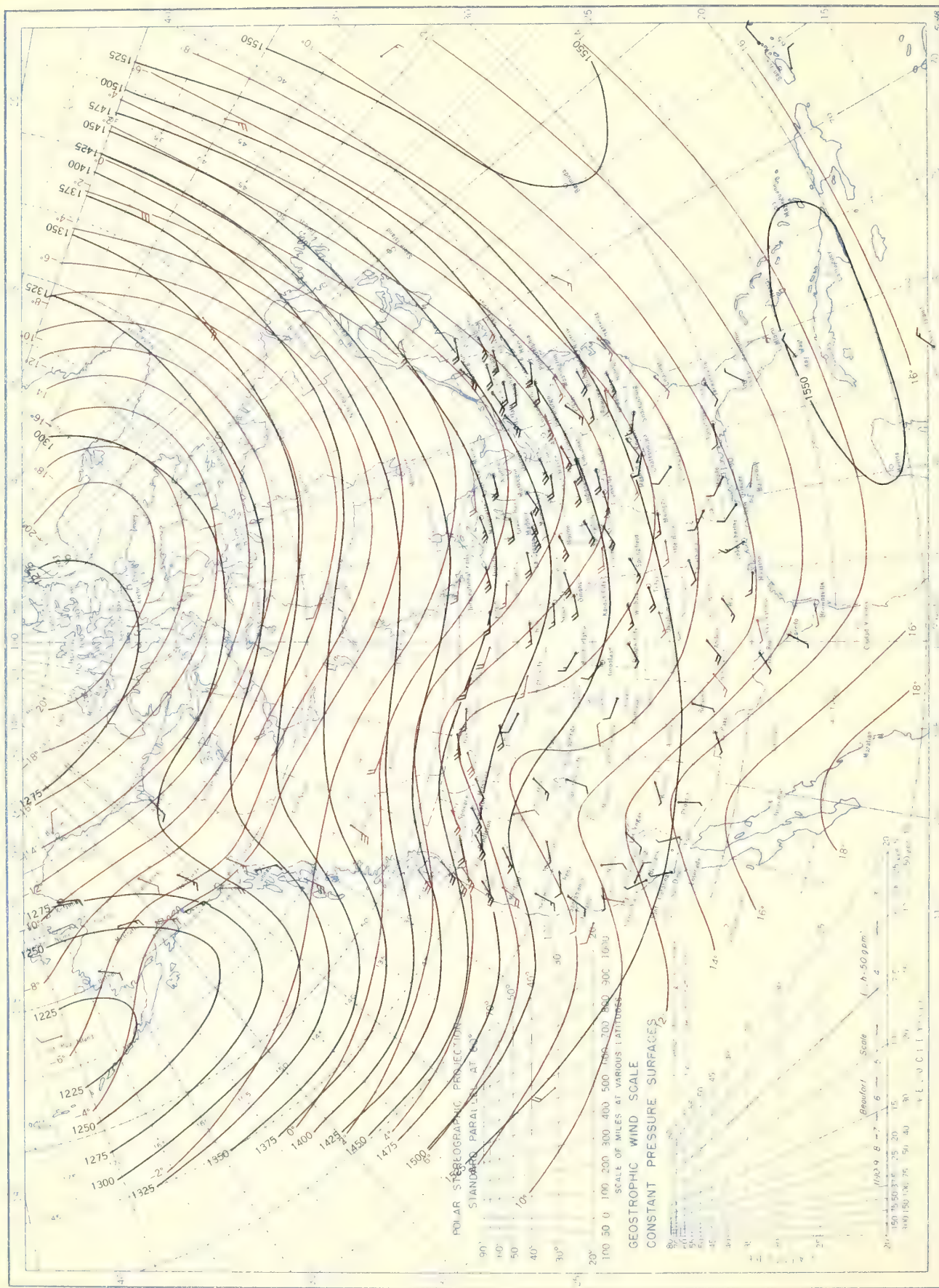




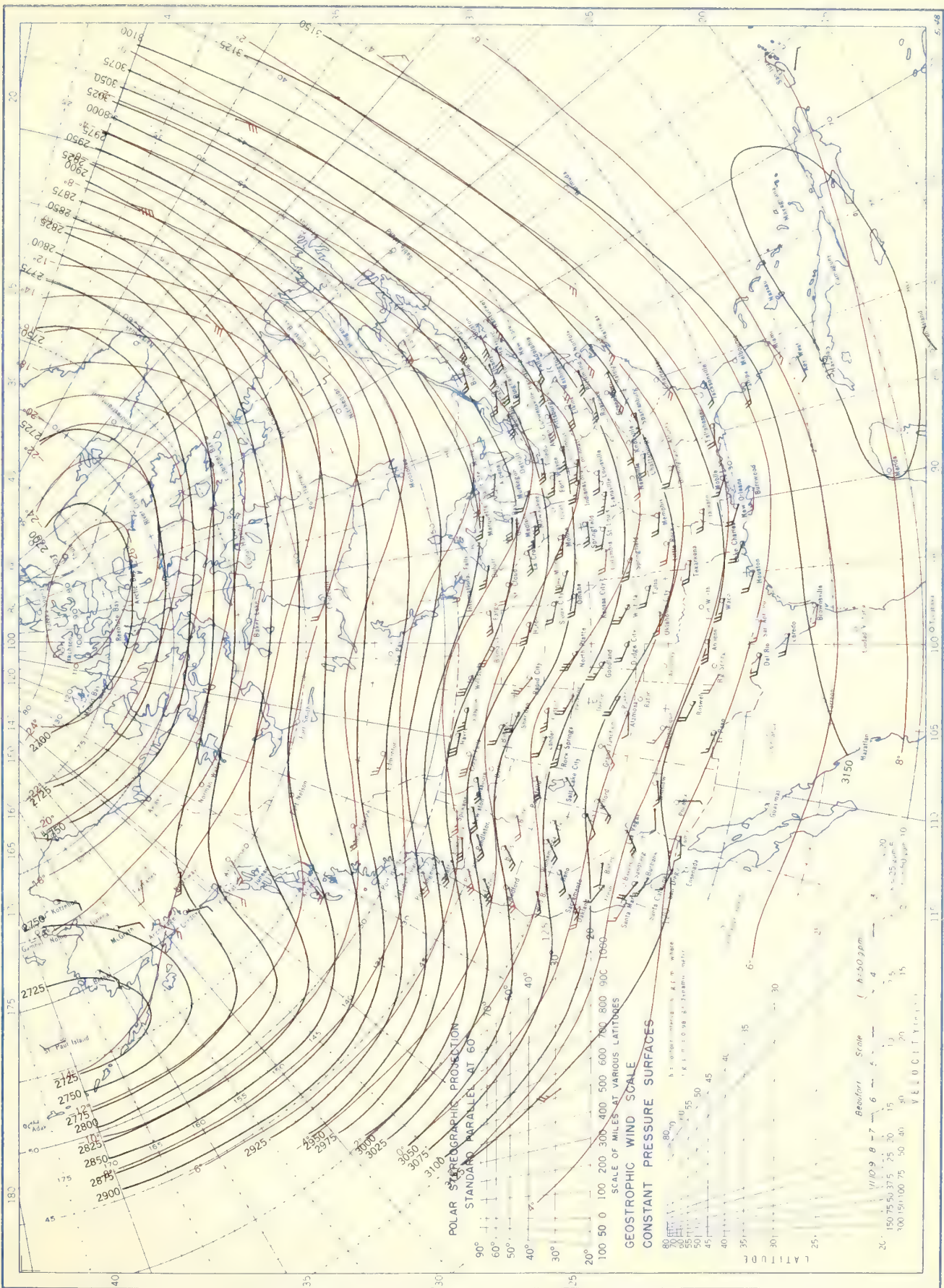
Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), November 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.



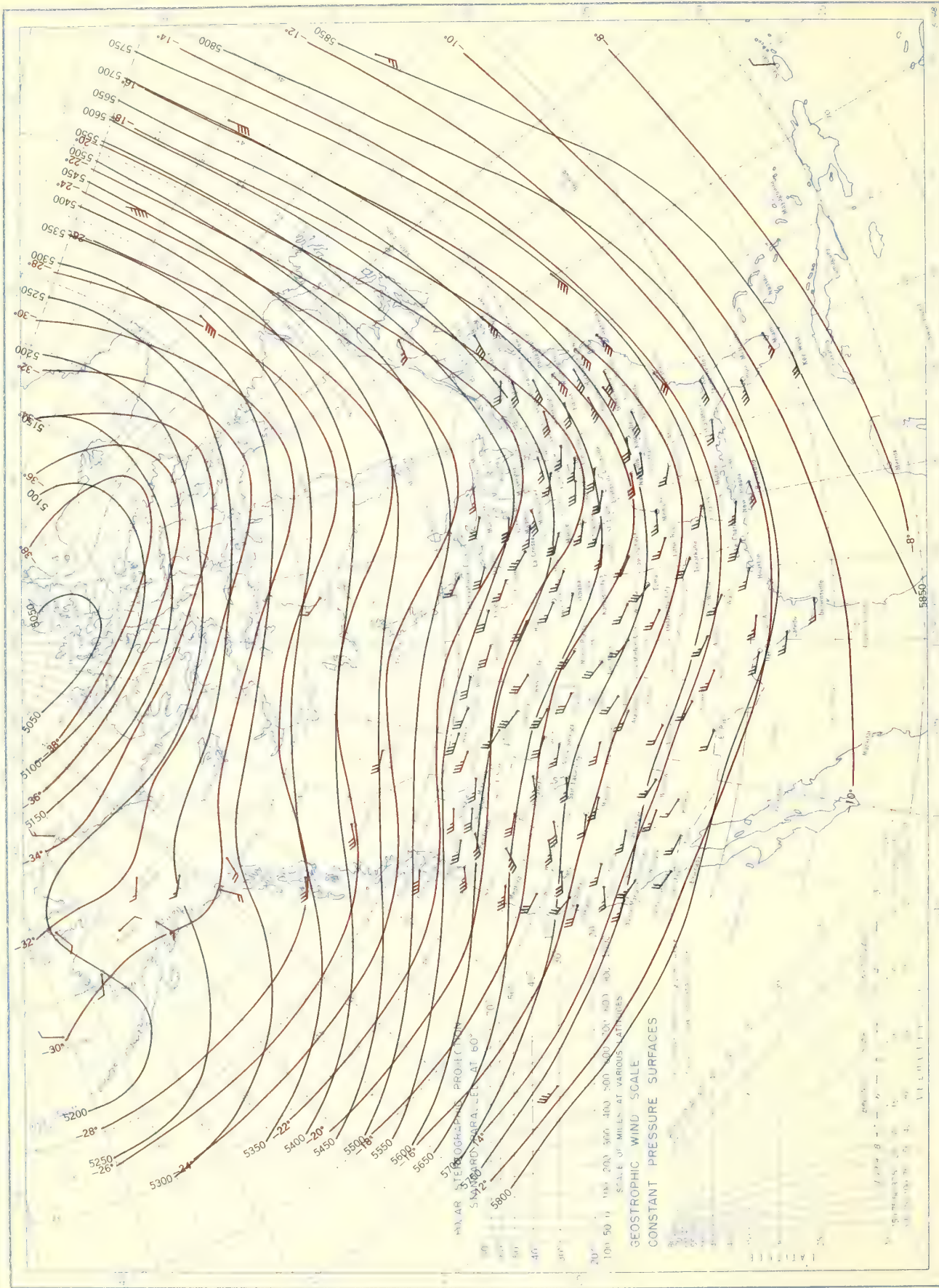
**Chart XIII. Average Dynamic Height (1 g.p.m. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), November 1953.**



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.



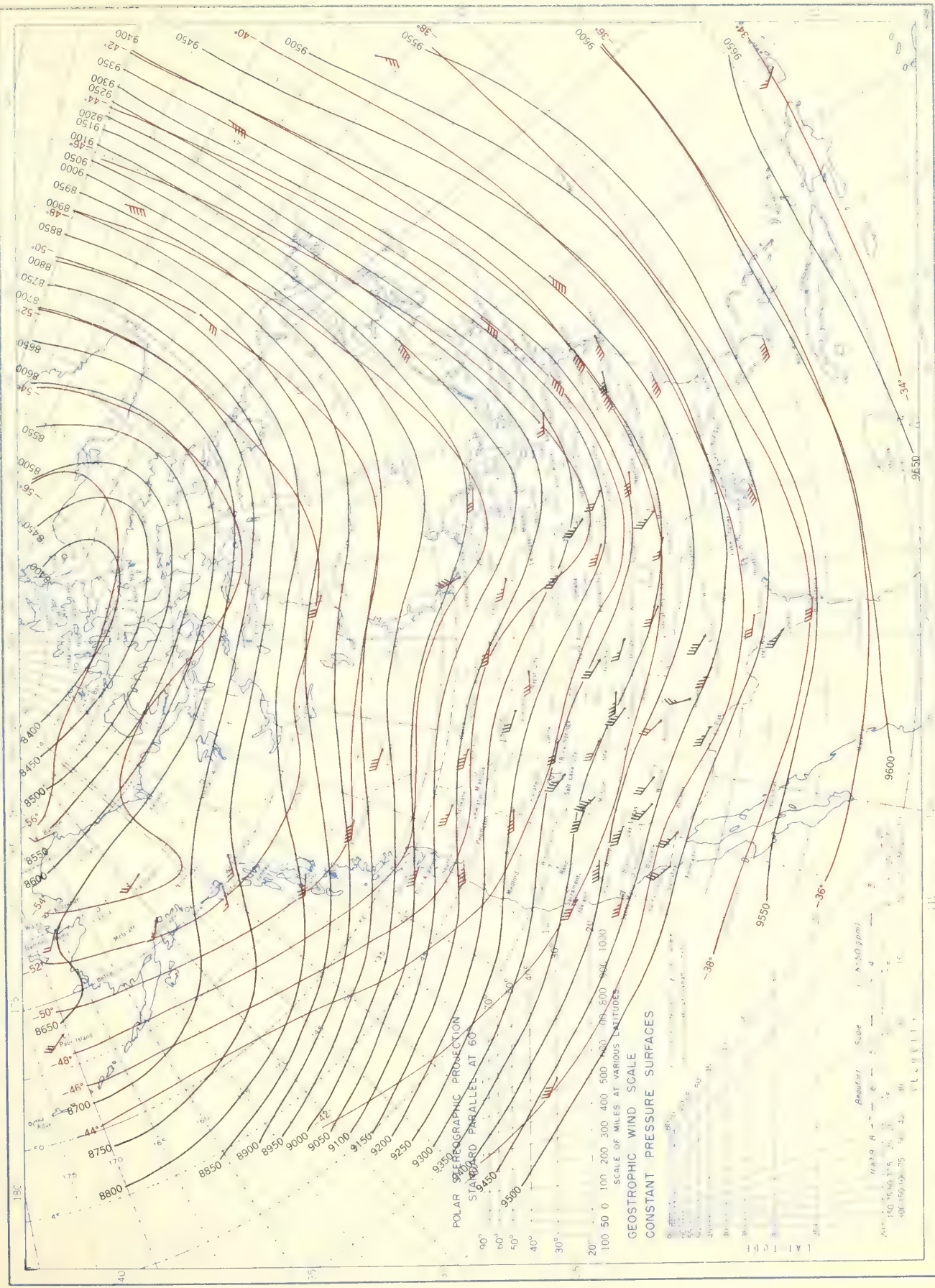
Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), November 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.



Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), November 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.



Clemson College Library

Clemson

South Carolina

CD

Penalty for private  
use to avoid pay-  
ment of postage  
\$300.

U. S. DEPARTMENT OF COMMERCE  
SINCLAIR WEEKS, Secretary  
WEATHER BUREAU  
F. W. REICHELDERFER, Chief

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

DECEMBER 1953

Volume 4 No. 12





## C O N T E N T S

SURFACE DATA	Page
General Summary of Weather Conditions-----	371
Condensed Climatological Data - States-----	373
Climatological Data - Stations-----	374
Heating Degree Days-----	378
Severe Storms-----	379
General Summary of River and Flood Conditions-----	384
Flood Stage Data-----	385
UPPER AIR DATA	
Radiosonde Data-----	386
Pilot Balloon Data-----	389
Rawin Data-----	390
SOLAR RADIATION DATA	
Solar Radiation Intensities-----	391
Blue Hill Data-----	392
Daily Totals and Average Daily Totals by Weeks-----	393
Daily Illumination on a Horizontal Surface-----	395
DELAYED DATA-----	396
CHARTS I-XV	

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

SUBSCRIPTION PRICE: Monthly and annual, 15 cents per copy; yearly subscription, including monthly and annual issues, \$1.50. Checks and money orders should be made payable to the "Superintendent of Documents." Remittance and correspondence regarding subscriptions should be sent to "Superintendent of Documents, Government Printing Office, Washington 25, D. C."

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

Volume 4 No. 12

DECEMBER 1953

### GENERAL SUMMARY OF WEATHER CONDITIONS

The most important weather feature of December was the frequent, widespread precipitation east of the Rocky Mountains that greatly helped to relieve the moisture shortage continuing from the drought of summer and fall. The nationwide precipitation average was above the long-term monthly mean for the first time since May. Precipitation was still insufficient, however, to restore subsoil moisture and replenish low water supplies in a belt extending from the east-central Great Plains through the Ohio Valley to western Pennsylvania. Drought conditions continued in the far Southwest.

Most unusual for December was the frequency of strong winds in the western two-thirds of the Country. Average wind movement for the month set new records at several scattered stations, among which were Fort Wayne, Ind., with 16.3 m.p.h. (a record for any month), and Yuma, Ariz., with 9.2 m.p.h. (record for December). Record extremes for December included 59 m.p.h. at Roswell, N. Mex., on the 5th, and 61 m.p.h. at Louisville, Ky., on the 4th. At Great Falls, Mont., the wind movement for the month averaged 21.8 m.p.h. and peak gusts of over 50 m.p.h. occurred on about one-third of the days with a high of 68 m.p.h. on the 30th.

The nationwide temperature average remained above the long-term mean for the seventh consecutive month, and average monthly departures from normal ranged from 8° above in extreme northern areas to 4° below in extreme southern districts.

Owing to the unseasonably mild weather in northern areas, rivers and lakes generally did not freeze over before the second half of the month. The Mississippi River froze over at La Crosse, Wis., on the 16th, but never completely froze over at Burlington, Iowa, although shore and floating ice were observed during the latter half. The Missouri River froze over at Bismarck, N. Dak., on the 17th and at Sioux City, Iowa, on the 23d. In the vicinity of Madison, Wis., lakes did not freeze over until the 30th.

While more than the usual December sunshine was received in most sections of the Country, it was slightly below normal along the Gulf Coast and north-central Border west of the Great Lakes and much below in north Pacific coastal areas where Tatoosh Island, Wash., recorded only 9.4% of the possible amount--24% of normal.

**PRECIPITATION.**--General precipitation from the eastern Great Plains to the Atlantic Coast, most of which fell during the first half of the month, replenished surface soil moisture and with the additional effect of unseasonably mild temperatures greatly improved fall-sown grains which generally were in good condition at the end of the month. Heaviest amounts fell in the Gulf and Atlantic Coastal States where monthly totals generally exceeded 2 inches except in parts of Florida. In the Southern States monthly totals ranged up to 22.54 inches at Bogalusa, La., 21.84 at Robertsedale, Ala., 16.87 at Purvis, Miss., 15.37 at Cuthbert, Ga., and 16.43 inches at Chipley, Fla. Monthly totals were the greatest on record for December at Macon, Ga. (9.43 inches), and Pensacola, Fla.

(14.67 inches). In the Northeast monthly totals ranged up to 7.05 inches at Searsburg Station, Vt., and 5.42 inches at Providence, R. I., was the second greatest December total on record there.

For Alabama the average precipitation of 10.42 inches (5.39 inches above normal) was the greatest December amount in 70 years of record, and resulted in excessive runoff throughout the State. Flooding in the southern portion of the State as a result of heavy rains during the period December 3 to 7 caused damages estimated at \$265,000. Totals for the 5-day period were 17.20 inches at Wallace, 13.21 at Robertsedale, and 12.98 inches at Fairhope. Wallace recorded the heaviest 2-day rainfall, 6 inches on the 3d and an additional 8.60 inches on the 4th, and Fairhope reported 9.80 inches on the 6th for the largest 1-day measurement.

Precipitation was much above normal in the central and northern Great Plains and Washington and Oregon, and slightly above in Montana and northern Idaho.

In the far Southwest the month was unusually dry. The Statewide average for Arizona was only 19% of normal, for California 32%, and for Nevada 50%. This was the driest December in California since 1930 and the second driest on record; it was the driest since 1917 at San Francisco, the driest on record at Red Bluff (monthly total, 0.46 inch). In southern California December ended the driest calendar year on record at Los Angeles where the total rainfall was only 4.08 inches, and the second driest at San Diego where the year's total of 3.41 inches was the least since 1863 when the total was only 3.02 inches. Forest fires in the San Gabriel Mountains of southern California on the 27th and 28th, fanned by high winds, spread over 14,000 acres causing losses estimated at \$6,000,000. At the end of the month ground water levels in southern Nevada and southwestern Utah were the lowest on record.

**SNOWFALL.**--December snowfall was above normal in some central portions of the western Plateau, in the lower Rocky Mountain region, the western portions of the lower Great Plains, and in a north-central area including the eastern Dakotas, most of Minnesota, northwestern Wisconsin, western and upper Michigan, and northern portions of Illinois, Indiana, and most of Ohio. In the Ohio Valley and Northeast snowfall was much below normal and the ground was bare virtually all month. Many sections of the north Atlantic Coast received no measureable snowfall at all.

The worst storm of the month occurred in the central Great Plains and upper Mississippi Valley from the 2d to the 4th when heavy snowfall up to 12 inches was drifted by high winds, blocking roads in northwestern Kansas, central Nebraska, eastern South Dakota, and portions of Minnesota. Unusually heavy local falls included a foot or more between Tipton and Maquoketa, Iowa, on the 9th, and a 20-inch fall at Dowagiac, Mich., on the 16th and 17th.

**TEMPERATURE.**--In the northern third of the Country the month was among the warmest Decembers on record. Temperatures were persistently above normal, except for two or three brief cold snaps east of the Continental Divide during the latter half. At



## GENERAL SUMMARY OF WEATHER CONDITIONS—Continued

DECEMBER 1953

Missoula, Mont., the temperature averaged above normal every day except the 8th when it was 1° below normal. Although no unusual extremes were recorded, maxima in the 50's and 60's occurred almost to the Canadian Border on several occasions. Average temperatures for Pennsylvania, New York State, and New England were the third highest on record. At New York City the temperature averaged 40.7°, the highest December average since 1871.

In contrast, the month was considerably colder than normal in southern areas. And it is interesting to note that on a few occasions minimum temperatures in southern areas were as low as those near the Canadian Border. The best example of this occurred on the 25th when minima were 27° at Santa Maria, Calif., 31° at Yuma, Ariz., and 29° at Corpus Christi, Tex., while Havre, Mont., recorded 29°, Houghton, Mich., 34°, and Buffalo, N. Y., 30°.

The freeze in the Southwest on the 24th and 25th slightly damaged some unheated citrus orchards in southern California and southern Arizona. Minima in the latter area fell to record low levels for December on the 24th, and absolute minima were reported from a few stations including Duncan, Ariz., where -2° was recorded. On the 25th frost and freezing occurred in the lower Rio Grande Valley, but no damage was reported; Del Rio recorded 17.3° and Laredo 26.3°--both new December records.

In the Southeast, unusually low temperatures from the 17th to the 20th damaged water pipes and radiators in northern Alabama, and on the 19th frost damaged some tender vegetables in the Florida Everglades.

On the 28th a severe cold wave reduced temperatures as much as 49° in 24 hours in extreme north-central areas where the lowest temperature for the month, -36°, was recorded by Big Falls, Cass Lake, and Pokegama Dam, Minn., on the 30th. Lowest temperatures in the Pacific States occurred at most stations during the third week, in the Mountain States on various dates, in south-central areas from the 22d to the 24th, in the extreme upper Lakes region on the 30th, and in the Ohio Valley and the East from the 17th to 19th.

Highest temperatures in the far West were recorded during the periods 9-11, 14-20, and 27-28, at a few stations in the central and northern Great Plains on the 31st, elsewhere in the Great Plains on the 1st and 5th, in the Mississippi Valley from the 3d to the 5th, and in the remaining eastern portions of the Country from the 4th to 6th except in the Southeast from about the 9th to the 12th. The highest temperature recorded during the month was 94° at McAllen, Tex., on the 4th.

**DESTRUCTIVE STORMS.**--The outstanding storm during December was the tornado that struck Vicksburg, Miss., on the 5th, killing 38 persons, injuring 270 and destroying property estimated at \$25,000,000. All other storms during the month caused less than \$3,000,000 damage. The worst was a series of tornadoes in north-central Louisiana on the 3d that killed 9 persons, injured 53, and resulted in property losses of \$515,000. On the 3d and 4th snow, glaze, sleet, and wind caused \$200,000 damage in extreme southwestern Minnesota.

# CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

DECEMBER 1953

Section	Temperature								Precipitation							
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes					
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least		
	*F.	*F.		*F.			*F.		In.	In.		In.		In.		In.
Alabama	45.3	-2.4	Fort Morgan	78	7	Scottsboro	8	18	10.40	+5.37	Robertsdale 7E	21.84	Hodges	4.84		
Arizona	40.0	-2.9	Mesa Exp. Farm	86	1	Maverick	-17	6	26	-1.05	Mount Lemmon	1.20	19 Stations	.00		
Arkansas	41.1	-1.7	Crossett	72	6	Mount Magazine	0	23	3.15	-1.04	Crossett	7.15	Calico Rock	.82		
California	46.4	+8	Santa Ana Fire Sta.	92	14	Big Bear Lake Dam	-2	30	1.04	-2.94	Gasquet RS	12.00	28 Stations	.00		
Colorado	25.0	-1.0	Eversoll Ranch	68	1	Taylor Park	-30	23	.70	-.24	La Veta Pass	2.58	2 Stations	T		
Connecticut	36.3	+6.1	4 Stations	63	*6	2 Stations	1	18	5.51	+1.67	Norwich 5SW	7.01	Natchaug Ranger Sta.	4.26		
Delaware	40.6	+3.8	6 Stations	68	*6	do	10	18	3.53	+1.11	Wilmington Porter Res.	4.55	Bridgeville	2.65		
Florida	62.0	+2.0	2 Stations	89	*21	do	19	18	5.87	+3.05	Niceville	20.00	Marathon Vaca Key	.33		
Georgia	48.1	-1.3	Folkston 9SW	81	6	Blairsville Exp. Sta.	1	18	8.64	+4.41	Cuthbert	15.37	Blackbeard Is.	4.19		
Idaho	27.6	+1.3	Mountain Home	62	19	2 Stations	-19	*7	1.75	-.21	Elk River 1S	EB.35	Arco	.03		
Illinois	33.4	+2.2	Harrisburg	68	5	Stockton	-12	17	1.74	-.41	Chenoo	3.32	Mount Olive	.35		
Indiana	33.3	+1.6	Mt. Vernon Wtr.Wks.	68	7	Greensburg 3SW	-14	18	1.99	-.73	Muncie 4SE	3.69	Fowler Pwr. Substa.	.63		
Iowa	28.5	+4.1	Keosauqua	61	3	2 Stations	-19	17	1.34	+1.25	Maquoketa 6NE	3.15	2 Stations	.58		
Kansas	34.3	+1.4	3 Stations	68	*1	do	-7	23	1.33	+1.48	Holton	2.89	Richfield 10SW	.38		
Kentucky	36.8	-1.0	Inez	75	4	Corbin CAA AP	-7	18	2.72	-1.10	Russellville	4.40	Keene 2N	1.21		
Louisiana	49.4	-2.5	4 Stations	80	*3	3 Stations	14	24	8.41	+2.67	Bogalusa 2E	22.54	Vidalia Natchez	3.50		
Maine	30.5	+8.3	Bar Harbor	61	10	Fort Kent	-17	28	4.32	+1.98	Wachias	6.59	Fort Kent	2.57		
Maryland	39.4	+4.1	2 Stations	69	*7	Bittinger 2NW	4	*18	3.40	+1.23	Westminster	5.58	Luke	1.74		
Massachusetts	36.7	+6.5	Rochester	66	7	Birch Hill Dam	-2	19	4.83	+1.22	Adams	6.36	Haverhill	3.02		
Michigan	29.1	+4.4	3 Stations	63	4	Champion Van Riper Pk.	-21	23	1.95	+1.02	Houghton Lake	4.00	Atlanta 3ENE	.90		
Minnesota	16.9	+1.6	Zumbrota	54	3	3 Stations	-36	30	1.26	+1.50	Walker Ah Gwah Ching	2.31	Roseau Power Plant	.40		
Mississippi	45.4	-2.9	2 Stations	76	*3	Houston	9	18	7.58	+2.26	Purvis	16.87	Thyatira	4.04		
Missouri	36.4	+2.5	Ozark Beach	69	2	Carrollton	-11	23	1.39	-.79	Deering	3.55	Jefferson City	.34		
Montana	28.4	+5.4	3 Stations	60	18	West Yellowstone	-23	27	.84	+1.09	Essex	8.15	Harlowton	T		
Nebraska	29.4	+2.3	Oxford	68	1	Bridgeport	-13	9	1.02	+1.31	Westpoint	2.83	Trenton	.06		
Nevada	32.3	-4	Indian Springs	72	18	2 Stations	-13	8	.42	-.52	Jarbridge	2.36	7 Stations	.00		
New Hampshire	31.2	+7.9	Nashua 3N	65	5	Fabyan	-11	19	3.88	+1.77	McDowell Dam	5.65	Berlin	2.62		
New Jersey	38.3	+4.5	Phillipsburg	70	7	Layton 3NW	3	18	4.37	+1.76	Cedar Grove	6.86	Fortescue	2.46		
New Mexico	31.3	-4.4	Carlsbad	79	16	Gavilan	-30	9	.46	-.26	Sandia Crest	2.77	4 Stations	.00		
New York	32.7	+6.5	2 Stations	64	7	Stillwater Rsvr.	-23	19	3.22	+1.28	Bridgehampton	6.88	Penn Yan	.90		
North Carolina	43.5	+5	do	77	*5	Banner Elk	2	18	5.40	+1.67	Coweeta No. 8	14.02	Waterville	2.17		
North Dakota	20.4	+6.4	Hettinger	51	18	Wahpeton State Sch.	-28	16	.61	+1.13	Grassy Butte 10N	1.37	Bismarck 12ENE	.09		
Ohio	34.1	+2.4	2 Stations	69	*4	3 Stations	-6	18	1.93	-.78	Chardon	4.50	Toledo Sewage	.95		
Oklahoma	40.7	+1.4	4 Stations	71	1	Newkirk 3SSW	0	23	1.29	-.44	Sokol Tower	5.04	Texhoma	.00		
Oregon	36.8	+2.5	6 Stations	65	*2	Seneca	-6	*23	5.14	+1.88	Tidewater	23.95	Paisley	.34		
Pennsylvania	35.0	+3.7	Uniontown	69	6	Kane INNE	-7	17	3.28	+1.7	Fredericksville 1SE	6.94	Bakerstown 3WNW	.91		
Rhode Island	38.7	+5.6	Block Island WB AP	64	8	Greenville	7	18	5.74	+1.89	Austin	6.20	Providence WB AP	5.42		
South Carolina	46.8	+1	Blacksville 3W	79	7	2 Stations	5	18	7.05	+3.46	Edgefield	11.31	Sullivan's Is.	5.10		
South Dakota	25.3	+3.3	3 Stations	59	*1	Deerfield Dam	-22	22	.68	+1.7	Watertown CAA AP	1.85	2 Stations	T		
Tennessee	39.1	-1.7	Murfreesboro	73	5	Crossville Exp. Sta.	-5	18	4.23	-.31	Jasper	7.68	Newport TVA	2.24		
Texas	45.2	-2.8	McAllen	94	5	Marathon	-3	24	1.71	-.33	Buffalo	9.02	Numerous Stations	.00		
Utah	26.4	-7.7	2 Stations	65	1	Cove Fort	-17	6	.72	-.38	Alta	8.76	Partown	.00		
Vermont	30.0	+7.7	Bellows Falls	59	9	Enosburg Falls	-19	19	3.48	+1.69	Searsburg Sta.	7.05	St. Albans	1.80		
Virginia	39.7	+1.8	4 Stations	72	*6	2 Stations	-1	18	3.47	+1.36	Meadows of Dan 5SW	6.60	Davenport	1.02		
Washington	37.3	+3.7	3 Stations	62	*2	Winthrop 1WSW	2	22	6.33	+1.35	Aberdeen 2NNE	28.39	Trinidad 2SSE	.31		
West Virginia	35.4	+8	Hamlin	71	5	Shady Springs 2ESE	-13	18	2.68	-.59	Pickens 1	5.68	2 Stations	1.41		
Wisconsin	23.7	+3.6	8 Stations	55	4	North Pelican	-28	30	1.82	+1.57	Prentice 5W	2.91	Brule Is.	.93		
Wyoming	23.6	+1.3	Torrington Exp. Farm	61	20	2 Stations	-29	*11	.56	-.21	Snake River	4.01	7 Stations	T		
Puerto Rico	75.2	+8	Ponce	96	31	Cidra	53	3	4.62	+1.30	Rio Blanco (1800 ft.)	14.99	Coamo Dam	.61		

\* Other dates also.

E Water equivalent of snowfall wholly or partly estimated, using a ratio of 1 inch of water equivalent to every 10 inches of new snowfall.

Note: Dates in Table 1 apply to the period 24 hours prior to time of observation. In some cases the actual occurrence is on the calendar date preceding that shown. (See individual Climatological Data for times of observations.)



## CLIMATOLOGICAL DATA

DECEMBER 1953

Table 2

[illegible]

See footnotes at end of table.

## CLIMATOLOGICAL DATA

Table 2-Continued

DECEMBER 1953

[illegible]

See footnotes at end of table.



## CLIMATOLOGICAL DATA

Table 2—Continued

DECEMBER 1953

State and station	Elevation (ground)	Pressure			Temperature										Precipitation										Wind				No. of days				
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days 90° F or above	Min. 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days 0.1 inch or more	With thunderstorms	Snow, Sleet, Hail	Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile	(sunrise to sunset)							
																										Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
Ft	Mb	Mb.	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	In.	In.	In.	In.	In.	In.	In.	In.	M	M	M	M	0-3	4-7	8-10	0-10	%			
NEW JERSEY (Cont.)																																	
Newark	11	1015.6	1016.5	47	31	39.2	+5.2	64	7	13	18	0	17	29.68	3.85	+0.75	0.98	12	2	T	T	10.6	SSW	*42	SSW	14	10	10	11	6.1	--		
Trenton CO	56	1009.8	1016.9	47	32	39.8	+4.8	65	7	15	18	0	14	--	3.80	+1.02	1.37	12	1	T	T	9.6	---	*38	NW	5	19	6	12	6.5	54		
NEW MEXICO																																	
Albuquerque	5310	850.3	1020.5	43	23	32.8	-3.2	62	1	13	23	0	28	17.55	2.9	-1.30	1.14	3	0	3.7	2	8.1	N	36	NW	3	13	12	6	3.8	72		
Clayton	4969	844.2	1017.6	46	19	32.5	-2.6	63	1	1	23	0	30	--	3.8	+0.02	1.35	4	0	3.5	3	--	--	--	--	5	20	5	6	3.2	--		
Roswell	3619	895.0	1019.9	52	19	35.8	-5.0	73	1	-3	24	0	28	15.47	2.1	-1.30	2.0	3	0	1.4	1	11.3	---	59	NW	5	19	4	8	3.6	--		
NEW YORK																																	
Albany	277	1011.2	1014.6	42	25	33.5	+7.1	55	10	5	19	0	26	24.69	2.76	+0.59	1.54	11	0	7.8	4	9.5	SSE	43	W	7	3	7	21	7.8	39		
Binghamton	1601	953.9	1014.2	39	25	31.8	+6.4	56	4	2	18	0	21	22.70	2.65	+0.05	1.16	15	1	8.4	3	14.3	SW	53	W	10	1	7	23	8.5	29		
Buffalo	693	985.4	1014.2	41	28	34.6	+5.6	60	4	9	17	0	19	25.70	3.08	+0.16	1.97	19	0	10.9	3	17.2	WSW	53	SW	4	0	10	21	8.2	31		
New York CO	10	1005.4	1020.1	47	34	40.7	+5.0	62	7	14	18	0	11	--	4.01	+0.94	1.40	12	1	T	0	15.5	--	68	SW	14	10	11	10	5.5	52		
New York	19	1014.9	1016.6	48	36	41.7	+6.0	61	10	16	18	0	9	29.63	4.81	+1.81	1.75	12	0	T	0	14.8	SW	47	NW	7	8	13	10	6.0	--		
Rochester	543	994.2	1013.9	41	27	34.0	+5.8	58	3	8	17	0	17	27.75	1.97	-0.43	1.75	16	1	10.2	2	13.0	SW	49	W	10	2	7	22	8.1	29		
Schenectady	217	1000.0	1013.9	43	28	35.3	+9.4	55	8	9	19	0	22	--	2.87	+0.44	1.55	9	0	4.8	3	--	--	--	--	15	9	7	7	4.9	--		
Syracuse	424	992.2	1014.9	42	27	34.9	+5.8	60	4	7	19	0	12	25.69	2.61	-1.13	1.66	20	0	15.4	4	10.5	WSW	47	NW	10	1	5	25	8.8	26		
NORTH CAROLINA																																	
Asheville CO	2203	944.8	1021.0	--	29	38.9	-1.3	66	5	8	18	0	18	--	2.67	-0.29	1.75	10	0	5	T	9.2	---	33	E	13	10	6	15	6.0	46		
Asheville	2093	944.8	1021.0	--	29	38.9	-1.3	66	5	8	18	0	18	--	2.67	-0.29	1.75	10	0	5	T	9.2	---	33	E	13	10	6	15	6.0	46		
Charlotte	753	992.2	1020.5	52	34	43.1	+1.1	66	6	11	18	0	15	33.70	5.87	+2.08	1.45	12	1	T	0	6.2	SW	39	SW	14	11	5	15	5.7	55		
Greensboro	891	988.2	1021.0	51	30	40.1	0.0	66	6	11	18	0	19	30.71	4.55	+1.44	1.45	11	0	0	0	7.6	SW	34	SW	14	13	3	15	5.5	54		
Hatteras	4	1019.6	1020.1	57	45	51.0	+1.5	72	9	27	18	0	4	43.76	4.72	-0.37	1.31	16	0	0	0	12.4	SW	44	SW	14	11	8	12	5.4	55		
Raleigh CO	400	1005.4	1020.1	53	35	44.7	+7.2	9	14	18	0	14	--	5.44	+2.23	1.83	13	0	T	0	6.3	--	36	SW	14	13	6	12	5.3	55			
Raleigh	438	1004.4	1020.4	54	33	43.4	+1.0	72	9	13	18	0	18	33.71	4.84	+1.43	1.50	13	0	0	0	7.1	SW	--	--	13	5	13	5.3	--	--		
Wilmington	30	1019.6	1021.0	60	39	49.6	+1.0	76	9	19	18	0	10	--	5.67	+2.21	1.72	13	0	0	0	8.4	--	47	SW	14	11	5	15	5.5	56		
Winston-Salem	967	985.8	1020.1	50	32	41.3	+7.7	65	6	12	18	0	16	28.64	4.85	+1.62	1.41	10	0	T	0	7.9	WSW	*30	WSW	14	14	2	15	5.4	--		
NORTH DAKOTA																																	
Bismarck	1650	952.9	1015.0	33	14	23.6	+8.1	48	6	-9	17	0	31	18.77	4.1	+0.1	2.2	8	0	4.0	1	10.9	NNW	47	NW	15	6	8	17	7.0	48		
Devils Lake CO	1471	958.3	1015.0	25	7	16.0	+4.3	40	1	-21	29	0	31	--	8.8	+0.40	3.3	10	0	11.4	7	8.9	--	31	NW	3	7	8	16	7.0	43		
Fargo	895	978.3	1014.8	23	6	14.7	+1.8	40	31	-27	16	0	31	11.80	7.0	+1.0	3.1	11	0	8.6	8	16.1	SSE	49	W	25	5	12	14	6.6	62		
Williston CO	1877	944.5	1014.5	33	16	24.4	+8.7	48	6	-3	22	0	31	18.76	6.2	+0.8	3.5	8	0	4.6	1	7.6	---	41	W	25	6	7	18	7.0	39		
OHIO																																	
Akron	1210	978.0	1017.2	40	24	31.9	+1.8	62	4	2	18	0	25	25.75	1.87	-0.71	1.66	11	1	7.4	5	11.6	SSW	--	--	4	8	19	7.5	--	--		
Cincinnati Obs.	761	985.8	1017.2	45	28	36.1	+1.1	64	4	5	18	0	20	--	1.70	-1.14	1.60	9	0	3.6	3	8.2	--	28	SW	4	--	--	--	--	48		
Cincinnati	869	985.8	1017.2	43	25	34.1	+5.3	64	4	0	18	0	21	25.70	1.58	-1.25	1.49	10	0	3.6	3	12.4	SSW	--	--	5	12	14	6.8	--	--		
Cleveland CO	663	987.8	1016.0	44	30	37.0	+4.1	65	4	8	18	0	16	--	1.68	-0.64	1.86	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Cleveland	787	987.8	1016.0	42	27	34.1	+3.2	64	4	5	18	0	22	25.71	2.62	+0.33	1.13	13	0	6.0	3	14.4	SSW	43	S	4	3	9	19	7.6	52		
Columbus CO	724	987.8	1016.0	43	30	36.7	+3.4	65	4	7	17	0	15	--	1.77	-0.67	1.72	7	--	5.2	2	10.4	--	37	W	10	2	11	18	7.5	37		
Columbus	815	987.8	1016.0	43	25	34.0	+2.3	65	4	1	18	0	23	26.74	1.88	-0.61	1.68	9	0	5.3	2	10.4	--	37	W	10	2	11	18	7.5	37		
Dayton	1002	980.7	1018.0	41	25	33.0	+1.3	62	4	-3	18	0	23	25.73	1.56	-0.91	1.70	7	1	4.5	3	13.3	SSW	45	SW	4	3	12	16	7.3	43		
Portsmouth Area	715	987.8	1016.0	46	26	36.2	+1.4	69	4	5	18	0	23	--	1.78	-0.84	1.73	11	1	3.9	1	7.5	--	56	W	4	--	--	--	--	--		
Sandusky CO	603	992.6	1015.0	42	28	34.8	+3.3	64	4	8	18	0	21	--	1.94	-0.22	1.11	10	0	7.5	T	11.2	--	43	SW	4	6	7	18	7.0	42		
Toledo	622	991.9	1015.8	41	25	33.1	+4.2	62	4	5	18	0	24	26.75	1.86	-0.43	1.75	8	1	6.7	2	15.6	SW	48	SW	4	6	6	19	7.2	34		
Youngstown	1178	972.9	1016.6	40	25	32.8	+2.8	61	4	5	18	0	23	25.73	2.40	-0.54	1.77	15	1	8.8	3	13.1	SW	*35	WSW	4	4	10	17	7.7	--		
OKLAHOMA																																	
Oklahoma City	1280	971.6	1019.7	49	30	39.4	-0.8	61	7	11	23	0	22	27.62	1.61	+0.13	1.59	3	1	T	0	16.5	S	55	N	21	14	6	11	4.5	65		
Tulsa	672	994.2	1019.1	51	31	41.0	+2.2	65	7	10	23	0	17	27.60	1.17	-0.52	1.01	5	2	2	T	12.9	SSW	36	S	10	14	5	12	4.9	56		
OREGON																																	
Astoria	12	1022.0	1022.9	51	40	45.4	+2.7	59	16	34	16	0	0	43.89	12.21	+2.37	2.44	24	0	T	T	7.1	E	--	--	0	5	26	9.2	--	--		
Eugene CO	4140	880.1	1027.4	40	22	30.8	+3.1	48	2	12	11	0	31	24.77	1.57	+0.13	2.43	10	0	11.0	7	--	--	--	--	4	10	17	7.3	--	--		
Eugene	361	1010.8	1025.0	48	38	40.0	+2.4	60	19	28	30	0	5	41.90	7.40	+1.40	2.74	19	0	0	0	7.8	S	--	--	0	3	28	9.5	--	--		
Medford	4050	985.8	1025.0	36	26	31.2	+2.0	66	17	18	8	0	27	--	5.55	+1.23	1.41	17	0	39.5	23	--	--	--	--	1	3	27	9.0	--	--		
Medford	1312	978.0	1020.7	45	33	38.8	+3.3	65	23	25	25	0	13	36.92	2.62	-0.51	1.67	14	0	T	T	1.5	S	*32	WSW	19	1	1	29	9.3	--	--	
Pendleton	1489	968.2	1023.0	46	34	39.9	+4.6	58	19	25	24	0	11	32.74	2.00	+0.31	3.38	12	0	T	T	9.5	S	--	--	3	9	19	7.9	--	--		
Portland	22	1018.0	1023.8	49	38	43.7	+2.9	59	19	33	21	0	0	41.90	7.85	+1.68	1.73	22	0	T	T	8.0	SSW	43	S	9	0	1	30	9.6	13		
Roseburg	505	1006.4	1025.4	50	37	43.3	--	61	19	28	26	0	7	--	5.00	+0.07	1.14	14	0	0	0	3.5	--	20	W	9	0	2	27	9.2	15		
Salem	195	1016.6	1024.1	49	36	42.5	+1.5	58	19	26	22	0	7	40.92	7.80	+0.68	1.88	20	0	T	0	8.0	S	--	--								

## CLIMATOLOGICAL DATA

Table 2-Continued

DECEMBER 1953

State and station	Pressure				Temperature						Precipitation						Wind				No. of days (sunrise to sunset)														
	Elevation (ground)	Station	Sea level	Average maximum	Average minimum	Average	From normal			No. of days 32° F or below	No. of days 90° F or above	Average dew point	Average relative humidity	Total	From normal			No. of days		Snow, Sleet, Hail	Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile		to sunset		Sky cover, tenths (sunrise to sunset)	Possible sunshine						
							Departure from normal	Highest	Date						Lowest	Date	Greatest in 24 hours	Of inch or more	With thunderstorms					Total	Max. depth on ground	Average hourly speed	Prevailing direction			Speed	Direction	Date	Clear	Partly cloudy	Cloudy
ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	In.	In.	In.	In.	In.	In.	In.	In.	M. p. h.	M. p. h.	O-3	4-7	8-10	O-10	%									
TEXAS																																			
Ablene	1752	957.0	1019.5	56	33	44.4	-1.4	73	2	11	24	0	17	24.50	0.07	-1.30	0.67	1	0	0.5	0	13.8	SW	42	W	2	18	3	10	4.0	72				
Amarillo	3590	889.3	1018.2	49	24	36.4	-.9	67	1	7	23	0	29	21.59	.98	+.31	.63	2	0	1.0	1	12.4	SW	62	NE	11	17	8	8	3.7	83				
Austin	615	998.6	1021.0	59	38	48.6	-3.6	79	5	23	23	0	9	36.67	5.29	+2.58	4.02	9	5	0	0	9.9	S	47	W	2	10	9	12	5.6	54				
Brownsville	16	1016.9	1019.5	68	51	59.4	-3.0	86	5	32	26	0	1	49.71	6.42	-1.52	.41	6	0	0	0	12.5	RW	37	S	2	7	7	6	18	6.3	32			
Corpus Christi	40	1019.6	1020.6	65	46	55.4	-2.6	88	5	28	24	0	3	46.74	1.42	-.85	.43	10	0	0	0	13.0	RW	35	NW	5	15	5	11	4.8	58				
Dallas	487	1001.7	1021.0	55	36	45.6	-2.7	71	5	17	24	0	11	34.67	1.42	-.85	.43	10	0	0	0	13.0	RW	35	NW	5	15	5	11	4.8	58				
Del Rio	1091	985.8	1020.8	59	36	47.3	-5.9	74	2	17	25	0	13	31.58	.40	-.48	.28	5	0	0	0	7.1	SW	40	NW	5	11	11	14	5.6	53				
El Paso	3920	888.6	1020.0	53	26	39.5	-5.3	72	1	5	24	0	23	16.40	.39	-1.10	.14	1	2.2	1	10.4	NNE	61	N	5	23	2	6	2.9	87					
Fort Worth	544	999.7	1021.0	55	35	44.9	-3.2	70	2	16	24	0	11	31.63	1.32	-1.16	.79	5	2	0	0	12.2	S	30	N	22	14	6	11	4.8	8				
Galveston CO	7	-----	-----	60	49	54.1	-2.9	74	5	30	23	0	2	-----	3.30	-.96	.84	14	0	0	0	13.6	---	40	N	22	11	5	20	3.6	36				
Galveston	5	1020.0	1020.6	60	48	53.6	-2.9	74	5	29	23	0	2	46.76	5.16	+.34	1.33	16	2	0	0	14.0	N	---	---	5	6	20	7.3	---					
Houston CO	40	1015.6	-----	60	45	52.3	-3.5	81	5	27	23	0	2	-----	4.97	+.34	.97	13	3	0	0	10.9	---	34	N	22	7	7	17	6.5	43				
Houston	50	1018.3	1020.6	60	43	51.4	-3.8	81	5	26	24	0	4	41.71	7.24	+2.78	1.94	13	3	0	0	13.5	W	42	W	5	15	5	11	4.8	58				
Laredo	500	1005.1	1020.2	64	43	53.7	-5.6	91	5	26	25	1	3	38.62	5.56	-.38	.26	6	1	0	0	11.3	NW	30	ESE	11	11	7	13	5.5	---				
Lubbock	3243	905.5	1018.8	51	25	38.2	-2.4	69	1	4	24	0	37	20.53	.05	-.61	.05	1	0	0	0	15.2	WSW	45	NNE	11	17	4	10	3.9	---				
Midland	2854	918.4	1019.4	54	29	41.5	-----	69	1	8	24	0	20	20.47	.20	-----	.20	1	0	0	0	8.3	SW	30	W	5	18	7	6	3.6	---				
Port Arthur	16	1019.3	1020.5	60	42	51.1	-3.0	79	5	26	24	0	5	44.78	5.26	-.21	1.65	14	3	0	0	12.7	E	69	S	3	5	7	19	7.1	36				
San Angelo	1903	951.6	1020.1	56	33	44.4	-4.4	73	8	8	24	0	17	25.48	.13	-1.00	.12	2	1	0	0	11.3	---	---	---	13	10	8	4.8	---					
San Antonio	782	994.9	1020.5	60	39	49.4	-3.7	79	5	23	24	0	9	35.62	1.44	-.48	.60	9	2	0	0	7.9	N	40	NE	22	11	6	14	5.5	56				
Victoria	109	1015.9	1020.5	62	43	52.7	-4.1	85	5	26	24	0	4	40.66	1.67	-1.40	.60	9	0	0	0	10.3	---	144	N	22	8	5	18	6.6	---				
Waco	504	1001.4	1020.7	57	37	46.8	-3.4	76	2	21	24	0	9	35.66	3.18	+.44	1.10	10	1	0	0	11.2	S	---	---	13	5	13	5.9	---					
Wichita Falls	1027	982.1	1019.8	54	32	43.4	-.4	71	2	15	24	0	17	27.56	.52	-.95	.52	2	1	0	0	11.3	S	40	W	2	17	5	9	3.2	---				
UTAH																																			
Milford	5028	851.3	1027.8	37	10	23.4	-4.6	55	20	-4	8	0	31	---	---	.38	-.37	.22	5	0	8.2	4	---	---	---	---	13	7	11	5.2	---				
Salt Lake City	4222	873.0	1026.1	38	21	29.9	-1.6	46	17	10	28	0	30	24.77	.91	-.43	.31	11	0	12.7	4	9.1	SE	31	SE	10	10	11	5.6	57					
VERMONT																																			
Burlington	331	998.0	1013.0	40	23	31.5	+8.7	55	°5	-2	19	0	25	25.74	1.94	+.06	.78	15	0	4.1	1	13.2	S	38	NW	23	1	5	25	8.5	25				
VIRGINIA																																			
Lynchburg	947	984.8	1019.4	49	30	39.3	+.4	66	5	11	18	0	18	27.65	4.86	+1.71	1.57	8	0	0	0	8.8	SSW	28	SW	14	11	5	15	5.8	54				
Richfolk	26	1018.6	1019.6	55	37	45.6	+2.8	71	7	23	19	0	10	36.70	2.69	-.19	.77	11	0	0	0	11.1	SW	42	NW	7	12	7	12	5.5	60				
Richmond	162	1013.5	1019.6	53	32	42.5	+3.0	70	6	11	19	0	17	31.67	2.94	+.05	1.31	9	0	0	0	8.1	S	31	NW	6	13	3	15	5.5	57				
Roanoke	1174	976.6	1019.9	49	28	39.1	+1.1	65	5	15	24	0	18	25.61	3.81	+.68	1.05	7	0	0	0	9.4	WNW	---	---	9	14	9.5	---	---					
Washington CO	72	-----	-----	50	34	41.6	+3.4	66	6	19	19	0	12	---	---	3.86	1.09	10	0	0	0	7.3	---	34	W	31	---	---	---	---	---				
Wash. Nat'l. AP	14	1014.2	1018.3	49	33	40.9	+2.9	66	6	17	18	0	13	28.63	3.32	+.71	1.14	10	0	0	0	9.7	SSW	42	SW	14	8	11	12	6.2	52				
WASHINGTON																																			
Olympia	190	1014.2	1021.8	47	35	41.0	+1.6	53	°2	28	17	0	11	38.87	9.42	+.76	1.86	20	0	0	0	7.1	SSW	+29	SW	20	0	2	29	9.1	---				
Seattle CO	14	-----	-----	49	41	44.9	+1.8	53	°9	35	22	0	0	---	3.31	-2.03	.95	16	0	0	0	11.5	---	59	SW	19	0	3	28	9.3	14				
Seattle	14	1020.7	1021.5	---	---	---	---	---	---	---	---	---	---	40.85	---	---	---	---	---	---	---	8.1	SSE	---	---	---	0	2	29	9.3	---				
Seattle-Tacoma	379	1007.1	1021.6	47	38	42.3	+2.5	51	°8	31	22	0	5	40.90	5.92	+.24	1.21	20	0	0	0	10.3	SSW	---	---	---	0	2	29	9.3	---				
Spokane	2357	950.9	1021.5	38	28	32.2	+4.1	47	9	24	°8	0	29	29.84	1.90	-.31	.67	10	0	4.8	2	9.5	SW	42	S	6	3	6	22	8.3	22				
Tatooash CO	101	1016.3	1019.7	49	42	45.8	+1.7	53	11	37	8	0	0	42.86	16.26	+2.22	2.35	27	0	0	0	19.5	---	59	S	5	0	1	27	9.4	6				
Walla Walla CO	949	985.4	1022.4	49	36	42.5	+6.2	60	19	°8	24	0	7	---	1.94	+.13	.68	13	0	0	0	6.9	---	34	SW	°6	2	11	18	7.7	22				
Walla Walla	1200	-----	-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	9.2	S	---	---	---	---	---	---	---	---	---				
Yakima	1061	982.1	1022.3	46	27	36.4	+5.8	56	2	21	30	0	29	29.78	.94	-.16	.46	5	0	.5	1	6.9	W	---	---	---	5	7	19	7.3	---				
WEST VIRGINIA																																			
Charleston	950	983.1	1019.3	47	28	37.7	-.4	68	4	9	18	0	21	28.70	2.45	-.53	.69	14	1	3.9	1	9.4	WSW	+55	WSW	4	6	17	7.0	7.0	---				
Elkins	1970	947.5	1019.6	44	23	33.4	+.5	64	6	0	19	0	26	25	---	2.53	-.60	.62	17	1	6.9	4	6.3	WSW	42	NW	10	5	21	7.6	37				
Buntington	565	-----	-----	48	28	37.9	-1.2	68	4	7	18	0	21	---	---	2.21	-.96	.84	13	---	1.5	1	---	---	---	---	---	---	---	---	---				
Parkersburg CO	615	-----	-----	46	29	37.3	+1.2	65	4	10	18	0	18	---	---	1.92	-.98	.54	13	1	1.1	1	6.7	---	24	NW	6	5	9	7	7.2	31			
Parkersburg	837	-----	1018.5	---	---	---	---	---	---	---	---	---	---	27	---	---	---	---	---	---	10.1	SW	---	---	---	---	---	---	---	---	---				
Petersburg	1013	-----	-----	49	28	38.7	+4.1	66	8	11	18	0	18	---	---	1.68	-.15	.67	7	0	0	0	---	---	---	---	---	---	---	---	---				
WISCONSIN																																			
Green Bay	689	989.8	1013.3	33	18	25.5	+5.4	51	4	-6	30	0	29	19.75	1.59	+.33	.49	13	0	3.2	1	12.2	SW	52	SW	4	6	7	18	7.2	36				
La Crosse	652	988.5	1014.1	34	18	26.0	+5.5	52	3	-10	17	0	29	19.73	1.42	+.20	.76	11	2	2.5	1	11.2	S	+25	NW	14	4	7	20	7.4	---				
Madison	857	981.4	1014.0	35	20	27.8	+4.8	53	°3	-3	17	0	29	21.76	2.17	+.77	.79	11	0	4.7	3	12.7	SW	47	SW	4	6	6	19	7.2	39				
Milwaukee	675	988.2	1014.0	35	22	28.7	+3.0	53	4	3	17	0	28	22.75	1.87	+.39	.70	12	0	1.6	1	14.9	SW												

Data from airport unless otherwise specified. CO indicates data from city office.

\* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

\* Data entered in 1980.  
 ° Other dates also.

† Per. k. gust.



# HEATING DEGREE DAYS

(Base 65°F.)

DECEMBER 1955

Table 3

State and station	Current season		Normals July through this month	State and station	Current season		Normals July through this month	State and station	Current season		Normals July through this month	State and station	Current season		Normals July through this month
	This month	Period July through this month			This month	Period July through this month			This month	Period July through this month			This month	Period July through this month	
ALABAMA				INDIANA (Cont'd.)				NEW HAMPSHIRE				TENNESSEE (Cont'd.)			
Birmingham	662	1148	1130	South Bend	1039	2127	2442	Concord	1008	2429	2907	Nashville	793	1425	1372
Mobile	444	699	623	Terre Haute	996	1902	2081	Mt. Washington	1592	5550		TEXAS			
Montgomery (CO)	513	835	780									Abilene	629	1067	1048
Montgomery	549	928	864	IOWA				Atlantic City (CO)	688	1333	1597	Amarillo	881	1577	1730
ARIZONA				Burlington	1041	1998	2334	Newark	797	1560	1912	Austin	502	766	646
Flagstaff	1131	2867	2967	Des Moines	1103	2072	2472	Trenton (CO)	776	1565	1852	Brownsville	223	259	218
Phoenix (CO)	403	538	555	Dubuque	1212	2401	2801	NEW MEXICO				Corpus Christi	323	385	365
Phoenix	479	646	645	Sioux City	1175	2257	2733	Albuquerque	989	1728	1757	Dallas	594	962	870
Prescott	874	1653	1720	KANSAS				Clayton	1002	1938	1991	Del Rio	540	738	585
Tucson	499	681	649	Concordia (CO)	917	1753	2048	Roswell	900	1545	1415	El Paso	784	1199	1086
Winslow	1006	1948	1903	Goodland	1150	2261	2461	NEW YORK				Fl. Worth	615	1004	890
Yuma	283	358	364	Topeka (CO)	902	1618	1891	Albany	973	2229	2583	Galveston (CO)	337	461	402
ARKANSAS				Topeka	926	1714	2027	Binghamton	1023	2401	2851	Galveston	356	483	418
Ft. Smith	758	1337	1273	Wichita	876	1587	1763	Buffalo	937	2045	2470	Houston (CO)	396	549	465
Little Rock	701	1202	1179	KENTUCKY				La Guardia Field	746	1411	1771	Houston	422	603	509
Texarkana	635	1079	913	Louisville (CO)	920	1661	1884	New York City	718	1336	1732	Laredo	367	444	306
CALIFORNIA				Louisville	812	1425	1645	Rochester	954	2129	2516	Lubbock	823	1446	1444
Bakersfield	542	881	819	Pikeville (CO)	779	1482	1733	Schenectady	915	2047		Midland	722	1060	
Bishop	782	1643	1675	LOUISIANA				Syracuse	926	2083	2369	Port Arthur	431	666	587
Blue Canyon	696	1909	2006	Baton Rouge	442	709	615	NORTH CAROLINA				San Angelo	631	1028	854
Burbank	237	427	580	Lake Charles	418	642	593	Asheville (CO)	801	1610	1633	San Antonio	489	702	600
Eureka (CO)	514	1848	2033	New Orleans (CO)	350	500	429	Asheville	853	1881		Victoria	396	524	408
Fresno	587	1006	1011	New Orleans	380	551		Charlotte	673	1185	1274	Waco	557	879	754
Los Angeles (CO)	188	303	451	Int. Airport, Moisant	398	605	484	Greensboro	763	1422	1513	Wichita Falls	662	1101	1181
Los Angeles	257	474	697	Shreveport	588	970	848	Hatteras (CO)	426	713	788	UTAH			
Mt. Shasta (CO)	815	2050	2326	MAINE				Raleigh (CO)	619	1119	1166	Midford	1283	2491	2551
Oakland	427	1035	1238	Caribou	1313	3353	3918	Raleigh	665	1242	1304	Salt Lake City (CO)	1024	1832	2100
Red Bluff	473	892	942	Greenville (CO)	1188	3060		Wilmington	471	882	869	Salt Lake City	1086	2015	2279
Sacramento (CO)	487	880	980	Portland	982	2464	2847	Winston-Salem	733	1288	1458	VERMONT			
Sacramento	540	994	1072	MARYLAND				NORTH DAKOTA				Burlington	1033	2443	2925
Sandberg (CO)	698	1517	1403	Baltimore (CO)	686	1298	1537	Bismarck	1279	2772	3524	VIRGINIA			
San Diego	323	327	496	Baltimore	795	1645	1741	Devils Lake (CO)	1513	3169	3903	Lynchburg	791	1487	1625
San Francisco (CO)	301	1147	1247	Frederick	870	1908	1841	Fargo	1556	3067	3604	Norfolk	593	1101	1257
San Francisco	426	1191	1360	MASSACHUSETTS				Grand Forks	1594	3260		Richmond	691	1359	1532
San Jose	388	756	861	Boston	761	1600	2015	Pembina	1545	3125		Roanoke	795	1502	1632
Santa Maria	367	1036	1113	Milton	881	1983		Williston (CO)	1250	2707	3566	WASHINGTON			
COLORADO				Nantucket	727	1675	2078	OHIO				Olympia	736	2091	2254
Alamosa	1533	3632	3621	Pittsfield	1023	2595	2933	Akron	1020	2142	2298	Seattle (CO)	617	1511	1776
Colorado Springs	1074	2296	2391	MICHIGAN				Cincinnati (CO)	843	1533	1711	Seattle-Tacoma	697	1934	2163
Denver	1033	2058	2364	Alpena (CO)	1073	2522	2962	Cincinnati	949	1799	1999	Spokane	978	2324	2750
Grand Junction	1166	2151	2293	Detroit	964	1945	2333	Cleveland (CO)	863	1589	2011	Tatoosh Island (CO)	587	2150	2480
Pueblo	1098	1976	2279	Escanaba (CO)	1185	2657	3213	Cleveland	948	1868	2181	Walla Walla (CO)	691	1527	1966
CONNECTICUT				Grand Rapids (CO)	978	1995	2382	Columbus	955	1922	2139	Yakima	881	2159	2476
Bridgeport	903	1662	2059	Grand Rapids	1012	2189	2640	Dayton	984	1882	2128	WEST VIRGINIA			
Hartford	862	1896	2280	Lansing	1031	2247	2629	Sandusky (CO)	927	1789	2116	Charleston	841	1653	1720
New Haven	842	1848	2163	Marquette (CO)	1190	2678	3167	Toledo	983	2026	2376	Elkins	973	2338	2295
DELAWARE				Muskegon	964	2166	2593	Youngstown	993	2154	2274	Huntington (CO)	831	1585	1597
Wilmington	810	1667	1841	Sault Ste. Marie	1253	3027	3575	OKLAHOMA				Parkersburg (CO)	854	1712	1824
DIST. OF COLUMBIA				Ypsilanti	1001	2042		Oklahoma City (CO)	769	1349	1367	Petersburg (CO)	807	1765	1981
Washington (CO)	717	1361	1604	MINNESOTA				Oklahoma City	788	1373	1417	WISCONSIN			
Washington	739	1410	1630	Duluth (CO)	1487	3334	3690	Tulsa	736	1287	1382	Green Bay	1218	2601	3125
FLORIDA				Duluth	1527	3339	3842	OREGON				La Crosse	1201	2356	2931
Apalachicola (CO)	287	466	475	International Falls	1696	3683	4223	Astoria	603	1807		Madison (CO)	1153	2285	2747
Daytona Beach	163	254	288	Minneapolis	1329	2514	3015	Burns (CO)	1052	2496	2829	Madison	1150	2347	2846
Fort Myers	91	129	126	Rochester	1315	2709	3144	Eugene	679	1691	1939	Milwaukee (CO)	1086	2082	2523
Jacksonville (CO)	247	432	416	St. Cloud	1517	3006	3483	Madison	1040	2734	3105	Milwaukee	1119	2222	2663
Jacksonville	242	470	473	MISSISSIPPI				Medford	808	1744	1849	WYOMING			
Key West (CO)	19	21	18	Jackson	583	972	882	Pendleton	772	1766	2095	Casper	1240	2582	3021
Melbourne	118	165	171	Meridian	620	1049	956	Portland (CO)	610	1361	1627	Cheyenne	1147	2571	2912
Miami (CO)	55	66	53	Vicksburg (CO)	552	893	775	Portland	653	1625	1817	Lander	1231	2666	3339
Int. Airport, Hialeah	53	64	60	MISSOURI				Roseburg	667	1553		Rock Springs	1273	2885	3353
Miami Beach	32	36	37	Columbia	887	1643	1973	Salem	691	1724	1815	Sheridan	1093	2404	3113
Orlando	117	226	222	Kansas City	890	1576	1875	Sexton Summit (CO)	804	2310	2373	PENNSYLVANIA			
Pensacola (CO)	367	575	529	St. Joseph	971	1801	2048	Allentown	896	1964	2205	Harrisburg	842	1759	1971
Tallahassee	378	607	606	St. Louis (CO)	797	1423	1703	Park Place (CO)	1037	2368	2735	Park Place (CO)	1037	2368	2735
Tampa	126	183	223	St. Louis	842	1546	1805	Philadelphia (CO)	716	1341	1624	Philadelphia (CO)	716	1341	1624
West Palm Beach	63	62	69	Springfield	867	1603	1841	Philadelphia	784	1540	1791	Pittsburgh (CO)	827	1642	1890
GEORGIA				MONTANA				Pittsburgh	827	1642	1890	Pittsburgh	827	1642	1890
Albany	431	744	708	Billings	990	2068	2767	Reading (CO)	808	1601	1871	Scranton (CO)	880	1977	2272
Athens	649	1122	1109	Glasgow (CO)	1190	2526	3458	Scranton	935	2063	2250	Williamsport	935	2063	2250
Atlanta (CO)	659	1101	1113	Great Falls	1000	2123	2959	RHODE ISLAND				Block Island	721	1550	1963
Atlanta	649	1113	1125	Hayre (CO)	1112	2430	3298	Providence	817	1650	1963	SOUTH CAROLINA			
Augusta	562	1033	835	Helena	1032	2525	3349	Charleston	375	649	658	Charleston	444	827	778
Columbus	558	975	951	Kalispell	1057	2900	3334	Columbia (CO)	516	876	900	Columbia (CO)	516	876	900
Macon	517	905	824	Miles City	1097	2324	3068	Columbia	569	1016	978	Florence	522	930	1015
Rome	738	1341	1256	Missoula	1016	2651	3270	Greenville	665	1136	1200	Greenville	665	1136	1200
Savannah	418	754	675	NEBRASKA				Spartanburg	656	1166	1211	Spartanburg	656	1166	

## SEVERE STORMS

Table 4

DECEMBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Bexar County (eastern portion), Tex.	1	5:45 p.m.			0	0	\$0	\$0	Tornado	Very dark cloud in north and another from south merged about 5:45 p.m. A short time later 3 funnels seen dropping from merged cloud, but none apparently touched ground. Occurred 10 miles west of tornado that struck south of Seguin at 7 p.m. (See below).
Seguin (near), Guadalupe County, Tex.	1	7 p.m.	*1	5	0	10	53,000		do	Struck 7 miles south of town. 7 homes destroyed and 7 damaged. Very little hail. Tornado traveled north-northeastward.
Huntsville, Walker County, Tex.	1	8:20 p.m.	20	**100					Wind	Several barns and chicken houses destroyed; 1 house damaged; few trees blown down.
Tanglewood, Lee County, Tex.	2	6:15 a.m.	100	**880	0	4	50,000		Tornado	Moved northeastward. Damage to homes, churches, and town hall. 3 homes destroyed. Baptist church leveled.
Lane City, Wharton County, Tex.	2	10:30 a.m.	200	1½	0	0	5,000		do	Moved northward. 2 farm homes pushed from foundations.
Navasota (6 miles west of), Wash- ington County, Tex.	2	1:35 p.m.	50		2	5	500		do	1 house completely demolished and 2 damaged; windmill damaged; barn demolished.
Hempstead (4 miles southeast of), Waller County, Tex.	2	2:30 p.m.					500		Wind	3 tourist cabins and office damaged; cabins knocked from foundations. Plate glass windows broken.
Pollock, An- gelina County, Tex.	2	2:45 p.m.	100	3	0	0	1,750		Tornado	3 houses unroofed; 2 garages damaged; 2 houses "blown out of plumb"; dwelling moved off foundation.
Bryan Air Force Base (3 miles west of), Brazos County, Tex.	2	3:00 p.m.			0	0			do	Moved northeastward. Home completely destroyed.
From ¾ miles west of Ardmore, Carter Coun- ty, to 4 miles south of Sulphur, Murray Coun- ty to ¾ miles north- east of Sul- phur, Okla.	2	7:30-9:30 p.m.	880	35	0	2	5,000	0	Tornado and hail	Accompanied by light hail which caused no damage. Path to northeast but not continuous, funnel touched ground at intervals. May have been series of tornadoes rather than single tornado. In area west of Ardmore, damage about \$2,000 and 1 person injured; in areas near Sulphur, damage about \$3,000 and 1 person injured.
Sulphur and vicinity, Okla.	2	8:30-9:10 p.m.					10,000		Winds	High winds, exclusive of tornadoes listed above, caused extensive, but scattered damage to roofs, trees, signs, etc.
Shawnee, Okla.	2	9:30-10 p.m.	880	1½	0	1	4,000	0	Tornado	Well-defined northeastward path through city of Shawnee, with much minor damage.
Nebraska, northeast- ern portion	2-3	Night and morning	*60	80			142,500		Ice (glaze)	Telephone and electric lines and poles severely damaged, also television antennae and shade trees. Damage estimate includes cleanup costs.
Vernon, Ra- pides, Grant, La Salle and Frank- lin Parish- es, La.	3	1-4:30 a.m.	300	75	9	50	500,000	10,000	Tornado, wind, light- ning, and rain	Originating near Cravens, moved northeastward through Leander, Lecamp, and Hinston areas, then just north of Alexandria, through Paradise, east of Colfax, through Dry Prong to Tullios and into Franklin Parish. 7 persons killed, many homes, barns, and other buildings destroyed and damaged in Leander and Lecamp areas; 4 buildings destroyed, 43 others damaged at Camp Beauregard, north of Alexandria; in Grant Parish 2 homes, many barns, and other buildings destroyed, 25 homes damaged; at Tullios 2 persons killed, 20 homes and many other buildings destroyed or damaged. Crop damage mostly to harvested crops and agricultural supplies in storage. Much timber destroyed and damaged. Very severe lightning with little thunder in Colfax area. Tornado passed 20 miles east of climatological substation near Winnfield and thermograph chart shows a rapid rise of 5° and then a very rapid fall of 12°. High winds accompanied it on both sides over an area of 20 miles wide. Rain was excessive over all of area.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

DECEMBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Mansfield, (near), De Soto Parish, La.	3	3 a.m.		1	0	3	\$5,000	\$0	Tornado	Destroyed 1 home. One of the victims reported "it sounded like a freight train".
Issaquene and Sharkey Counties, Miss.	3	5:30 a.m.	300	15	0	20	410,000	100,500	do	Most damage at Fitler community in Issaquene County, about 18 miles southwest of Rolling Fork, Miss. Left 40 persons homeless; 45 buildings destroyed. Some damage in west-central Sharkey County. Most damage to crops was to harvested crops and agricultural supplies in storage.
Port Arthur, Jefferson County, Tex.	3	6:24 a.m.					5,000		Wind	Line of damage oriented from west to east. Gusts of 90 m.p.h. at Port Arthur Weather Bureau Airport Station.
South Dakota, eastern portion	3								Snow and wind	This 6- to 14-inch snowstorm moved northward, accompanied by 30 to 40 m.p.h. winds which piled snow in 4-foot drifts. Temperatures in teens during storm lessened effect of blizzard conditions. Rural schools closed on 3d and 4th. Main roads open by noon of 4th.
Minnesota, extreme southwest- ern counties	3-4						200,000		Glaze (ice), sleet, snow, and wind	Many poles, wires, and antennae down, and communications and electric power services seriously disrupted. Trees and shrubbery badly damaged. Traffic delayed. Some rural schools closed. Storm especially severe in Jackson County and vicinity where extensive damage to overhead wire-systems.
Alabama, southern portion	3-7						265,000		Rains	Occurred in Baldwin, Clarke, Covington, Escambia, and Geneva Counties.
Hillsboro, Wis.	4	4 a.m.					1,000		Wind	Hog barn damaged.
Fond du Lac, Wis.	4	A.m.					650		do	Building damaged.
Medford (near), Wis.	4	A.m.					1,000		Electrical	Lightning killed bull.
Wisconsin, southeast- ern portion	4	A.m.			1	1	15,000		Wind	Strong winds, with gusts to 60 m.p.h., damaged chimneys, antennae, and trees. At least 1 plate-glass window broken in Milwaukee. 1 person killed when blown from scaffold.
Maricopa, Pinal, and Pima Coun- ties, Ariz.	4	5-8 p.m.			1	7	20,000	0	do	Strong cold front was accompanied by gusty winds which reached 68 m.p.h. at Phoenix Airport. Principal damage to power and communication lines, signs, some roofs, and TV antennae. Death caused by motorist running into downed tree at height of windstorm.
Mt. Bethel Community, Cobb Coun- ty, Ga.	4	5:30 p.m.	100	½	0	0	36,500	0	Tornado	Funnel cloud observed moving northeastward through Mt. Bethel Community and Parkaire Airport. First struck between churches and school, with no damage. A little farther shingles blown off several homes and a store, and small garage shaken from its foundation. Most damage at Parkaire Airport where 3 hangars and 20 or more airplanes heavily damaged.
Portland, Ashley County, Ark.	5	9 a.m.						3,000	Hail	Principal damage to remnant cotton in fields.
Spearsville (near), Union Par- ish, La.	5	Afternoon		6	0	16	20,000	500	Tornado	1 home and 3 other buildings destroyed; 3 homes and several other buildings damaged. Moved northeastward into Arkansas.
Ouachita City, Rocky Branch, Spencer, and Beekman, in Ouachita, Union, and Morehouse Parishes, La.	5	5-6 p.m.		25	0	11	25,000	1,000	do	Destroyed 1 home, damaged 13 others. Apparently lifted northeast of Spencer and hit again near Beekman, then moved northeastward into Arkansas; possibly same tornado that hit Coahoma County, Miss.
Vicksburg, Warren County, Miss.	5	5:35 p.m.	500	7	38	270	25,000,000	0	do	Storm apparently formed just south of Vicksburg and did not touch ground until near edge of town. Traveling northeastward at approximately 40 to 50 m.p.h., went bouncing across town and destroyed a large portion of business and residential areas. Path of greatest destruction was about 1 city block in width and lesser damage extended another city block on both sides. Saenger Theater, full of children was severely damaged, killing many. 275 homes destroyed, about 300 damaged; 17 industrial plants

See footnotes at end of table.

## SEVERE STORMS

Table 4—Continued

DECEMBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Vicksburg, Warren County, Miss. (Cont'd.)	5									destroyed, 12 damaged; 76 businesses destroyed and about 200 damaged; many other buildings destroyed and damaged. Rescue work hindered when temperature fell to around freezing; all gas and electric power off. Reported as "worst disaster city has suffered since the war between the States".
Union County (southeast- ern por- tion), Ark.	5	6 p.m.					\$11,000		Wind	11 houses damaged and 3 outbuildings destroyed.
Ashley County, Ark.	5	6-7:35 p.m.	500	55	0	0	164,500	\$2,500	Tornado	First reported near Spencer, La., at 6 p.m. It lifted to northeast of town, then again touched ground 6 miles south of Arkansas line, just north of Beekman, La. Storm remained on ground across Ashley County, Ark., to point 5 miles northeast of Montrose, Ark., where it apparently dissipated. Extensive damage to timber for lumber and pulp wood, in heavily forested area in its path. Total of 4 houses destroyed and 6 damaged in Ashley County. Crop damage principally to remnant cotton.
Drew County (southeast- ern por- tion), Ark.	5	7 p.m.					25,000		Wind	7 houses destroyed and 4 damaged; 7 outbuildings destroyed and 4 damaged.
Mississippi, northern portion	5	Evening					1,500	1,000	do	Thunderstorms and squalls.
Clarksdale (10 miles west of), Coahoma County, Miss.	5	8:15 p.m.			0	11	24,000	1,000	Tornado	Struck farming section. Destroyed 11 homes, damaged 3 others; destroyed 5 buildings, damaged 4 others. Possibly same tornado that developed near Spencer, La., and moved into southeastern Arkansas.
Cumberland Homestead, Cumberland County, Tenn.	5	Night							Wind	Roof blown from new hosiery mill about 4 miles south- east of Crossville.
Henry County, Ala.	6	Between 7 and 8 a.m.			0	0	7,000	0	Tornado	Occurred in Napier Field vicinity, about 10 miles north of Dothan. Funnel-shaped cloud described as being "black as night".
Headland, Henry County, Ala.	6	8 a.m.		2	0	1	10,000	0	do	Eyewitness said he saw "twister" form in a field about 100 yards from his house and that funnel-shaped cloud moved northeastward. 15 homes damaged.
Tallahassee (10 miles north of), Fla.	6	Noon			0	0			do	Several buildings, autos, and trees destroyed.
Colorado, north- central portion	6	2-3 p.m.					30,000		Winds	General strong winds reached gale force in some localities, causing greatest damage in Denver and vicinity. Windows broken and some buildings and transmission lines damaged. 300-ft. TV tower on Lookout Mountain was a total loss when blown to ground.
New Jersey, entire State	6-7	P.m. 6th- a.m. 7th					3,500		Wind	Scattered minor damage throughout State to trees, communication and power lines, advertising signs, TV antennae, etc.
Long Beach, Nassau County, N.Y.	6	Evening			1				do	High winds blew down power lines and tree branches across others. A woman electrocuted by falling wire, while more than 10,000 homes were without light.
Washington, D. C.	6-7	Near mid- night			2		Minor		do	Caused scaffolding to collapse, 2 men working on scaffolding killed by fall.
Pennsylvania, central portion	6-7								Rain	Over 1.5 inches of rain flooded some sections of Harrisburg bumper-deep; caused sewers to overflow, affecting steam lines in some areas. In Sunbury, heavy rain shorted a transformer, putting most of city in darkness for 45 minutes.
Oregon, northern third from coast to eastern border	9	Early morning to late after- noon	75 to 100	300 to 400			40,000	Negligible	Wind	Gusts of 50 to 65 m.p.h. observed in western Oregon, and at Pendleton peak gusts of 75 m.p.h. recorded about 4 p.m. Much damage caused to power lines over northern Oregon either by winds directly or by trees which winds blew across them. Outdoor signs, numerous roofs, and some older buildings also damaged. Estimated \$3,500 damage caused to 4 light airplanes at Pendleton Field.

See footnotes at end of table.



## SEVERE STORMS

Table 4—Continued

DECEMBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Middleton, Henry County, Ind.	9	4:30-5:30 p.m.					\$4,000		Wind	Concrete block dwelling destroyed. Walls were almost completely destroyed, but roof was almost intact and displaced only about 20 feet. Amount of destruction resulted in storm being referred to as tornado in some quarters, but is thought to have been due to inability of poor construction of this type to withstand moderately heavy wind pressure.
Chillicothe, Ross County, Ohio	9	9 p.m.	100	$\frac{1}{2}$			100,000		do	Severe "squall line" wind of less than 1 minute duration occurred in West Side residential section, accompanied by 0.35 inch of rain in a few minutes. Ripped off roofs; uprooted trees; leveled garages; tore down power lines; twisted cars; bulged out side of 1 house; leveled concrete-block garage; smashed plate-glass windows; knocked out electrical service; and put radio station off air for 3 minutes.
Iowa, north- eastern portion	9				2				Snow	Snowfall up to 14 inches in Jackson and Clinton Counties. Highways hazardous. Icy roads near Clinton caused an accident which resulted in 2 deaths.
West Glen- ville, Schenectady County, N.Y.	10	A.m.					10,000		Wind	An intense line squall wrecked bus garage and damaged several busses stored within.
West Pembroke, Me.	10	6:45-7:15 p.m.				5	10,000	50	Electrical	Kerosene stove reportedly exploded by lightning. Resultant fire injured 5 persons and damaged home.
Massachusetts, cen- tral portion	10	Evening					2,500	0	Wind	5 communities blacked out for intervals as northwest gales toppled trees, interrupting power service; signs and TV antennae also blown down; several airplane flights cancelled because of high wind.
West Palm Beach, Fla.	10				0	0			Tornado	Tornado cloud observed from Weather Bureau Office at West Palm Beach Airport and estimated to have been about 5 miles northwest of station.
Wenatchee and vicinity, Chelan County, Wash.	11-12	11 p.m.- 5 a.m.					20,000		Wind	2 small aircraft destroyed and 2 business buildings damaged by strong northwest winds. Power and communications lines damaged.
Fontana district, San Bernardino County, Calif.	11								do	Santa Ana northeast desert wind, with speeds estimated at 60 to 80 m.p.h. forced down many trees and caused structural damage. Also extreme fire hazard prevailed. In Mt. Baldy district a forest fire raged out of control.
Montana, cen- tral and eastern por- tions east of Divide	12	Early morning and dur- ing day					15,000	Some	do	Minor damage such as breaking of storm doors and windows, roof damage, blowing over hay stacks, etc. About \$2,000 damage in Helena. At Mount mine near Nye (Stillwater County) damage about \$400. About \$1,000 damage at Miles City.
Jacksonville (10 miles east of), Fla.	13	6 p.m.			0	0	160,000		Tornado	Storm struck Craig Field, destroying a hangar and several airplanes, and tearing asphalt paving from portion of a runway. Storm moved north-northeastward. Wind damage in Southside Estates residential section, 4 to 5 miles west-southwest of Craig Field appeared to be of tornadic character, but destruction was far short of complete.
Marianna, Fla.	14	Morning							Sleet	
Meyersdale area, Pa.	14	Evening							Snow, sleet, and wind	Combination of elements felled 5 poles and tipped 3 others carrying primary power circuits, causing a blackout in area for about 12 hours.
Erie County, Pa.	16								Snow	Area received 4 to 12 inches of snow which disrupted bus service, closed at least one school, and resulted in series of highway accidents.
Milwaukee, Wis.	19-20	Night			3	33			Ice	Many traffic accidents attributed partly to slippery streets due to frost.
Oregon, northern half from coast to eastern border	19-20		*150 to 200	300 to 400	1	1	\$6,000	1,500 mostly to live stock	Wind	Wind reached speeds of 60 to 70 m.p.h. in gusts. Numerous roofs damaged; trees fell across power lines; a few older buildings blown down. In Willamette Valley a barn destroyed, killing 4 head of cattle, and a tree blown on moving automobile caused death of 1 man and injury of another. Damage to power and communication lines quite heavy, with many outages reported over entire storm area.
East side Puget Sound, vicinity of Seattle and Anacortes, Wash.	20	6 p.m.- midnight					50,000		do	Strong winds continued for several hours. In Seattle roof blown off business building, 2 homes damaged, numerous plate-glass windows broken, several trailers damaged, ferry service disrupted, dock damaged at Anacortes, power and telephone lines damaged, house boats on Lake Washington damaged.

See footnotes at end of table.

## SEVERE STORMS

Table 4-Continued

DECEMBER 1953

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Panama City (5 miles west of), Fla.	21	3:30 a.m.			0	0			Water- spout and tornado	Waterspout moved inland (northward) over beach community, causing major damage to 3 cottages, wrecking 1 auto, and downing power lines.
Annette, Alaska	21-23	3 p.m., 21st- 8:25 a.m., 23d	About *200						Wind	Storm from southwest moved toward southeast Alaska Coast; referred to as a "southeaster". Winds reached 70 m.p.h. at the Airfield. About 33% of roof from a newly constructed schoolhouse ripped off, causing rain to leak in which resulted in considerable internal damage.
Hershey- Palmyra area, Pa.	22	Morning				2			Fog	Heavy fog blanketed area, resulting in at least 4 traffic accidents.
Northumber- land and Snyder Counties, Pa.	26-27					6			Snow	Ice-coated highways resulted in traffic accidents.
San Gabriel Mountains and vicini- ty to south from River- side to Monrovia in Riverside, San Bernar- dino, and Los Angeles Counties, Calif.	27-28								Wind	Desert winds, with speeds estimated as 100 m.p.h., whipped through Cajon Pass in a broad sweep coastward, felling trees and power lines, and reducing visibility in sections of Riverside, San Bernardino, and Los Angeles Counties as dust clouds swept in. Blowing sand damaged many automobiles. 2 major forest fires raced out of control before strong, gusty winds of gale force in San Gabriel Mountains on 27th and 28th, forcing evacuation of hundreds of persons in Upper Monrovia, Big Santa Anita Canyon, and below Camp Baldy. Forest fires spread over 14,000 acres, with losses to homes, timber, and watershed estimated at \$6,000,000.

\* Miles instead of yards.

\*\* Yards instead of miles.



# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

## DECEMBER 1953

The most damaging floods during December were the flash floods in southern Alabama during the first decade which caused more than a quarter million dollars' damage. The flood in the Green River Basin in Washington was about equal to the last major flood of February 1951. The damage was not serious.

**ATLANTIC SLOPE.**--The light flooding on the Neuse River at Smithfield, N. C., between the 14th and 16th was due to heavy rainfall (2.75 inches) between the 12th and 14th. Rainfall averaged about 1.25 inches in the upper Roanoke Basin, and 2 to 3 inches in the middle and lower Roanoke Watershed. In the Tar River Basin the rainfall averaged 2 inches and in the Cape Fear Basin 3 inches. No overflows occurred along these streams.

This same storm caused minor overflow on the Broad River at Blairs, S. C., between the 13th and 15th. No damage was reported.

**EAST GULF OF MEXICO.**--Heavy rainfall of 3 to 5 inches during the period from the 4th to the 7th and again from the 10th to the 14th resulted in moderate to strong rises in the middle and lower portions of the Apalachicola River system. The only flooding that resulted was on the Apalachicola River at Blountstown, Fla., from the 7th through the 31st and on the Flint River at Albany, Ga., on the 12th.

Flash floods in southern Alabama between the 3d and 7th caused more than a quarter million dollars' damage. The heaviest rainfall reported was at Wallace where 6 inches were reported on the 3d and 8.6 inches on the 4th, or a total of 14.6 inches for the 2-day period. Another period of heavy rainfall occurred on the 5th and 6th, resulting in severe flash floods in Baldwin and adjoining counties. The heaviest rainfall during this storm was reported at Fairhope, which reported 0.5 inch on the 5th and 9.8 inches on the 6th, or a 2-day total of 10.3 inches. These floods were at their worst in the Thomasville-Evergreen-Brewton-Florala area on the 4th and in the Fairhope-Robertsdale area on the 7th. The floods in the Fairhope area in Baldwin County were the worst since the hurricane waters of 1906. The

flooding on the Choctawhatchee and Conecuh Rivers in Alabama was due to the same storm. The rainfall on the 3d and 4th averaged more than 5 inches for the 2-day period and more than 2 inches on the 6th. Some damage was reported on the Choctawhatchee River at and below Geneva, Ala.

Prior to these heavy rains the Cahaba River at Marion Junction, Ala., receded to a record-low December stage (1937-1953) of 1.8 feet. The previous December low record at this station was 2.0 feet on December 1 and 2, 1941.

Sharp rises to above flood stage occurred on the lower Pearl, Chickasawhay, Leaf and the upper Pascagoula Rivers from the heavy rainfall on the 3d, 5th, 8th and 11th. The rainfall amounts were locally in excess of 5 inches over the lower Pearl, and from 1 to 3 inches over the lower reaches of the Leaf and Chickasawhay and the upper Pascagoula Rivers.

**COLUMBIA BASIN.**--Precipitation was above normal over northwestern Oregon and southwestern Washington for the second consecutive month. There were three rainy periods: the first, from the 1st to the 12th; the second, from the 17th to the 21st; and the third, from the 24th to the 29th. The flooding reported was light and was confined mostly to the tributary streams of the Willamette River. The only flooding on the main stem of the Willamette was in the vicinity of Harrisburg and Oregon City, Ore. The crest stages were generally several feet lower than during the November freshet. The only damage was that due to erosion.

**PUGET SOUND BASIN.**--Minor to moderate flooding occurred on the Chehalis, Green, Snohomish, and Snoqualmie Rivers between the 6th and 20th. Snow melt at higher elevations was a contributing factor to the floods in addition to the heavy rains on the 6th, 9th and 12th. The flood in the Green River was about equal to that of the last major flood of February 1951. The crest stages along the Snohomish and Snoqualmie were two to three feet less. Damage was negligible in the Chehalis, Snohomish, and Snoqualmie Valleys. Some light damage did occur along the Green River, but it was not of a serious nature.

# FLOOD STAGE DATA

(all dates in December unless otherwise specified)

Table 5

DECEMBER 1953

River and station	Flood stage	Above flood stages -dates		Crest*	
		From-	To-	Stage	Date
ATLANTIC SLOPE DRAINAGE					
Neuse: Smithfield, N. C.	13	14	16	15.0	16
Broad: Blairs, S. C.	14	13	15	14.8	14
Ocmulgee: Abbeville, Ga.	11	17	21	11.4	21
Altamaha: Charlotte, Ga.	15	27	28	15.5	28
EAST GULF OF MEXICO DRAINAGE					
Flint: Albany, Ga.	20	12	12	20.9	12
Apalachicola: Blountstown, Fla.	15	7	31	20.0	17-18
Choctawhatchee: Newton, Ala.	19	5	8	22.9	7
Geneva, Ala.	23	6	11	27.0	8
Caryville, Fla.	12	6 23	19 27	15.5 12.7	9 25
Conecuh: River Falls, Ala.	37	8	9	40.0	8
Pascagoula: Merrill, Miss.	22	11	18	22.2	15
Pearl: Bogalusa, La.	15	4 10	9 15	17.6 18.4	7 15
Pearl River, La.	12	6	18	14.6 15.4	8 14
PACIFIC SLOPE DRAINAGE Columbia Basin					
McKenzie: Leaburg, Ore.	12	10 20	10 20	12.6 16.6	10 20
Coburg, Ore.	11	20	20	12.2	20

River and station	Flood stage	Above flood stages -dates		Crest*	
		From-	To-	Stage	Date
PACIFIC SLOPE DRAINAGE (Cont'd.) Columbia Basin (Cont'd.)					
Santiam: Jefferson, Ore.	13	4 9 20	7 10 21	15.6 16.6 19.1	6 10 20
Yamhill: Whiteson, Ore.	38	11	11	38.4	11
Tualatin: Dilley 15, Ore.	12	10 20	11 21	12.7 12.1	10 20
Willamette: Harrisburg, Ore.	12	10 20	10 20	12.4 13.1	10 20
Oregon City, Ore.	12	10 22	13 23	12.7 12.3	11 22
Cowlitz: Randle, Wash.	10	20	21	13.7 14.0	20 21
Miscellaneous Basins					
Chehalis: Grand Mound, Wash.	14.5	8	11	15.6	9-10
Centralia 1W, Wash.	63	10	11	66.8	10
Skookumchuck: Centralia, Wash. (Harrison St. Bridge)	68	10	10	69.3	10
Green: Auburn, Wash.	63	9 12	10 12	67.2 64.4	10 12
Snoqualmie: Carnation 1NW, Wash.	51.5	6 9 12	6 11 12	51.7 56.8 53.7	6 10 12
Snohomish: Snohomish, Wash.	23.6	6 9 12 20	6 10 12 20	23.7 27.0 26.8 23.7	6 9 12 20

\* Provisional

\* Provisional



# RADIOSONDE DATA

Average monthly values

Table 20

DECEMBER 1953

ALBUQUERQUE N. MEX. ( 840 MB. )				ATLANTA, GA. ( 985 MB. )				BISMARCK, N. DAK. ( 953 MB. )				BOISE, IDAHO ( 923 MB. )				BROWNSVILLE, TEX. ( 1019 MB. )				BUFFALO, N. Y. ( 987 MB. )				BURRWOOD, LA. ( 1020 MB. )							
Standard pressure surface (mb.)																															
Number of observations				Dynamic height				Temperature				Relative humidity				Number of observations				Dynamic height				Temperature				Relative humidity			
SURFACE	31	1,619	1.1	44	31	309	5.9	78	31	505	- 4.4	81	31	868	- 0.4	87	31	7	14.5	77	31	221	1.0	69	31	3	14.2	82			
1,000---	31	183			31	183			31	122			31	220			31	165	14.9	71	31	117			31	170	13.7	76			
950----	31	609			31	611	6.3	60	31	535	- 6.0	76	31	638			31	603	13.5	64	31	535	.0	65	31	608	11.9	69			
900-----	31	1,052			31	1,050	6.2	54	31	957	- 2.9	68	31	1,071	1.4	72	31	1,054	12.1	58	31	961	- 2.5	66	31	1,054	11.5	53			
850-----	31	1,517			31	1,518	5.6	46	31	1,409	- 3.8	61	31	1,530	.2	65	31	1,533	11.7	52	31	1,413	- 4.3	63	31	1,531	10.0	52			
800-----	31	2,006	.9	37	31	2,012	4.1	43	31	1,886	- 5.0	60	31	2,014	2.0	61	31	2,038	9.9	53	30	1,887	- 6.4	59	31	2,033	8.3	49			
750-----	31	2,533	1.8	38	31	2,544	1.7	39	31	2,394	- 8.6	59	31	2,532	- 4.5	58	31	2,577	7.4	53	30	2,395	- 8.8	54	31	2,571	5.7	50			
700-----	31	3,069	- 1.8	38	31	3,089	- 1.0	37	31	2,920	-11.8	55	31	3,066	- 7.3	58	31	3,139	5.0	45	30	2,922	-10.9	53	31	3,127	3.0	48			
650-----	31	3,651	- 8.3	38	31	3,683	- 4.3	41	31	3,492	-15.3	51	31	3,645	-10.5	53	31	3,744	- 1.6	42	29	3,500	-13.1	53	31	3,725	.0	47			
600-----	31	4,265	-11.6	37	31	4,304	- 7.8	41	31	4,083	-19.2	50	31	4,252	-14.1	52	30	4,378	- 2.3		29	4,097	-16.4	54	31	4,361	- 3.8	47			
550-----	31	4,930	-16.0	37	31	4,980	-11.7	42	31	4,731	-23.2	45	30	4,918	-17.9	48	30	5,063	- 6.8		28	4,762	-20.3	54	31	5,042	- 7.7	42			
500-----	31	5,638	-20.9	35	31	5,700	-15.7	41	31	5,416	-28.0	41	30	5,619	-22.5	46	30	5,800	-11.7		28	5,454	-24.8	51	31	5,779	-12.4	41			
450-----	31	6,417	-26.7	35	30	6,497	-21.2		31	6,169	-33.4		30	6,393	-27.7	45	30	6,607	-17.1		28	6,222	-29.8	46	31	6,587	-18.0	38			
400-----	31	7,247	-32.6	35	26	7,344	-26.9	40	31	6,981	-38.9		30	7,221	-33.7	44	30	7,473	-23.6		27	7,031	-36.0		31	7,446	-24.0	43			
350-----	31	8,174	-39.5		30	8,293	-33.8		31	7,884	-45.2		30	8,144	-30.5		30	8,434	-30.5		27	7,945	-42.3		31	8,406	-31.1	44			
300-----	31	9,212	-46.2		30	9,355	-41.5		31	8,899	-50.4		30	9,178	-47.8		30	9,510	-38.4		26	8,982	-47.9		31	9,480	-39.1				
250-----	31	10,405	-52.6		30	10,569	-49.5		30	10,083	-53.3		30	10,361	-54.7		29	10,737	-46.8		26	10,168	-53.1		31	10,703	-48.1				
200-----	30	11,829	-56.0		30	12,007	-56.2		30	11,517	-53.2		30	11,774	-58.5		29	12,182	-56.2		24	11,584	-54.9		31	12,141	-57.1				
175-----	30	12,674	-57.0		29	12,844	-58.7		29	12,380	-52.1		30	12,615	-57.4		29	13,021	-60.5		24	12,436	-54.9		30	12,984	-60.9				
150-----	30	13,649	-57.6		29	13,804	-61.3		28	13,378	-52.2		29	13,588	-56.7		29	13,969	-64.6		23	13,414	-55.3		29	13,925	-64.6				
125-----	29	14,791	-59.5		27	14,924	-63.4		28	14,556	-52.3		29	14,742	-57.2		27	15,082	-68.3		22	14,581	-56.0		26	15,027	-67.2				
100-----	27	16,149	-62.0		26	16,283	-65.1		27	15,994	-52.3		29	16,153	-57.4		23	16,408	-71.6		19	15,967	-56.9		22	16,365	-58.9				
80-----	27	17,555	-61.8		20	17,632	-65.1		27	17,435	-52.5		24	17,564	-57.0		17	17,722	-71.0		17	17,402	-56.5		20	17,697	-69.0				
60-----	21	19,345	-60.3		19	19,360	-62.7		24	19,300	-52.2		24	19,390	-56.0		11	19,449	-65.1		16	19,233	-56.9		11	19,424	-65.0				
40-----	19	20,489	-59.0		17	20,523	-59.6		23	20,482	-52.2		23	20,552	-54.5		9	20,577	-61.6		13	20,404	-57.3		8	20,547	-62.3				
50-----	13	21,898	-56.8		12	21,920	-57.3		14	21,913	-52.0		21	21,986	-53.5		9	21,965	-59.6		11	21,823	-55.8								
30-----					7	23,756	-54.2		6	23,744	-52.9		16	23,831	-51.9						5	23,599	-55.8								

CARIBOU, ME. ( 988 MB. )				CHARLESTON, S. C. ( 1020 MB. )				COLUMBIA, MO. ( 989 MB. )				DODGE CITY, KANS. ( 926 MB. )				EL PASO, TEX. ( 884 MB. )				ELY, NEV. ( 813 MB. )				GLASGOW, MONT. ( 937 MB. )							
Number of observations				Dynamic height				Temperature				Relative humidity				Number of observations				Dynamic height				Temperature				Relative humidity			
SURFACE	31	191	- 5.1	86	31	13	9.2	88	31	238	2.0	62	31	792	- 0.2	72	31	1,195	5.3	39	31	1,908	- 4.7	67	31	648	- 3.2	73			
1,000---	31	93			31	176	12.6	69	31	142			31	165			31	1,170			31	234			31	127					
950----	31	501	- 5.2	76	31	613	11.0	63	31	561	2.3	56	31	582			31	1,602			31	658			31	541	-10.2				
900-----	31	921	- 6.6	75	31	1,056	9.3	54	31	993	- 8.5	54	31	1,019	3.1	52	31	1,049			31	1,096			31	970	- 5	61			
850-----	31	1,365	- 8.3	73	31	1,528	7.7	47	31	1,451	- .6	52	31	1,481	1.7	45	31	1,516	6.3	28	31	1,551			31	1,425	- 2.7	56			
800-----	31	1,835	- 9.6	70	31	2,027	6.3	38	31	1,934	- 2.3	49	31	1,968	- .4	41	31	2,011	4.3	28	31	2,035	- .4	55	31	1,903	- 5.0	53			
750-----	31	2,338	-11.4	66	31	2,563	4.3	36	31	2,449	- 4.5	46	31	2,481	- 2.8	41	31	2,542	1.5	28	31	2,554	- 2.8	48	31	2,411	- 8.1	55			
700-----	31	2,859	-13.6	59	31	3,113	- 1.4	38	31	2,985	- 7.3	44	31	3,025	- 6.1	45	31	3,085	- 2.0	31	31	3,093	- 5.8	47	31	2,940	-11.3	53			
650-----	31	3,429	-15.8	54	31	3,712	- 1.8	41	31	3,566	-10.5	42	31	3,603	- 9.5	45	31	3,676	- 5.4		31	3,674	- 9.1	46	31	3,515	-14.6	53			
600-----	31	4,020	-19.0	51	31	4,338	- 5.2	40	30	4,170	-14.1	40	31	4,215	-13.5	45	31	4,294	- 8.9		31	4,286	-12.4	43	31	4,107	-18.1	50			
550-----	31	4,667	-22.8	46	31	5,021	- 9.1	39	30	4,832	-17.6	35	31	4,871	-17.8	42	31	4,967	-13.5		31	4,948	-16.1	39	31	4,753	-22.2	50			
500-----	31	5,354	-27.4	46	31	5,748	-13.7		29	5,540	-22.1		31	5,578	-22.5	37	31	5,680	-18.6		31	5,658	-20.1	35	31	5,446	-26.8	48			
450-----	31	6,113	-32.5	45	31	6,551	-19.3	36	29	6,315	-27.8		31	6,348	-27.9	32	31	6,467	-24.4		31	6,438	-25.5	35	30	6,204	-32.0	45			
400-----	31	6,926	-37.7		31	7,406	-25.4	38	28	7,143	-34.2		31	7,178	-34.1		31	7,305	-30.3		31	7,274	-32.0	38	30	7,019	-38.1	47			
350-----	31	7,833	-43.6		31	8,360	-32.6	42	27	8,062	-40.7		31	8,100	-40.8		31	8,241	-36.8		31	8,204	-39.0		30	7,924	-44.5				
300-----	31	8,857	-48.4		31	9,427	-40.7		26	9,101	-47.5		29	9,129	-47.5		31	9,290	-43.8		31	9,243	-46.8		29	8,940	-50.5				
250-----	31	10,044	-52.7		31	10,644	-49.4		24	10,291	-53.9		29	10,317	-53.1		31	10,495	-50.1		30	10,427	-54.3		28	10,107	-54.1				
200-----	31	11,476	-54.0		31	12,078</																									



# RADIOSONDE DATA

Average monthly values

Table 20-Continued

DECEMBER 1953

LAKE CHARLES, LA. ( 1020 MB.)				LANDER, WYO. ( 828 MB.)				LAS VEGAS, NEV. ( 944 MB.)				LITTLE ROCK, ARK. ( 1011 MB.)				MAZATLAN, MEXICO ( 1012 MB.)				MEDFORD, ORE. ( 978 MB.)				MIAMI, FLA. (1019 MB.)				
Standard pressure surface (mb)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	5	10.7	77	30	1,696	- 5.0	71	31	660	6.1	27	31	79	5.0	68	30	14	22.3	72	31	401	4.1	93	31	4	20.1	82
1,000---	31	172	11.0	63	30	1,177			31	183			31	165	6.1	58	30	113	21.9	66	31	218			31	170	20.3	74
950---	31	603	9.7	58	30	597			31	611	4.4		31	588	5.4	54	30	570	21.5	41	31	642	4.8	80	31	611	18.1	73
900---	31	1,048	9.7	52	30	1,030			31	1,058	9.6	20	31	1,026	4.0	53	30	1,025	19.1	36	31	1,079	5.1	70	31	1,073	15.2	70
850---	31	1,522	8.3	51	30	1,484			31	1,530	7.1	22	30	1,487	2.6	50	30	1,513	15.6	34	31	1,544	3.6	63	31	1,556	13.3	58
800---	31	2,020	5.9	49	30	1,966	- 1.4	52	30	2,025	4.0	23	30	1,977	1.2	44	30	2,024	12.1	36	31	2,035	1.3	56	31	2,065	12.0	46
750---	31	2,556	3.3	51	30	2,484	- 3.6	46	31	2,553		27	30	2,499	- 1.0	45	30	2,575	8.4		31	2,555	- .9	51	31	2,606	9.9	36
700---	31	3,104	8	50	30	3,020	- 6.6	44	31	3,098	- 2.6	28	30	3,042	- 3.5	40	30	3,127	5.0		31	3,100	- 3.5	51	31	3,174	6.8	36
650---	31	3,702	- 2.2	45	30	3,603	-10.7	46	31	3,689	- 6.0		29	3,628	- 6.9	40	30	3,730	1.6		31	3,686	- 7.0	52	31	3,783	3.6	33
600---	30	4,326	- 5.7	38	30	4,206	-14.4	45	31	4,304	- 9.8	27	28	4,245	-10.4		30	4,368	- 2.7		31	4,331	-10.9	49	31	4,424	- .2	31
550---	29	5,007	-10.0		30	4,861	-19.0	45	31	4,975	-13.6		29	4,914	-14.5		30	5,054	- 6.9		31	4,965	-15.0	46	31	5,117	- 4.4	
500---	28	5,734	-14.6		30	5,562	-23.7	40	31	5,690	-18.6		28	5,625	-19.2		30	5,789	-11.8		31	5,679	-19.8	46	30	5,859	- 9.0	
450---	28	6,530	-19.9		30	6,326	-29.6	40	31	6,475	-24.8		27	6,409	-24.4		30	6,591	-17.5		31	6,458	-25.3	46	30	6,678	-14.3	
400---	28	7,387	-26.3		29	7,158	-35.8		31	7,313	-30.9		27	7,246	-29.6		30	7,459	-23.8		31	7,297	-31.5	47	30	7,550	-20.6	
350---	28	8,338	-33.2		28	8,070	-42.9		31	8,244	-38.0		27	8,186	-36.0		30	8,420	-30.7		31	8,227	-38.5		30	8,522	-27.5	36
300---	27	9,400	-41.4		27	9,090	-49.5		31	9,286	-45.7		27	9,238	-43.5		30	9,496	-38.7		31	9,269	-46.3		30	9,611	-36.0	
250---	27	10,614	-49.2		23	10,272	-55.5		31	10,478	-52.9		27	10,443	-50.4		24	10,734	-46.9		31	10,456	-54.5		29	10,851	-46.1	
200---	27	12,049	-56.8		20	11,677	-56.8		30	11,899	-58.5		27	11,881	-54.9		15	12,177	-55.5		31	11,862	-59.9		29	12,286	-57.1	
175---	27	12,889	-59.3		20	12,525	-55.8		30	12,737	-58.9		27	12,731	-56.0		8	13,022	-60.0		28	12,896	-59.0		29	13,129	-62.7	
150---	27	13,846	-62.2		18	13,510	-55.1		30	13,700	-59.5		27	13,705	-58.4						24	13,660	-58.6		29	14,063	-68.5	
125---	25	14,960	-65.1		18	14,671	-56.1		29	14,831	-60.3		26	14,843	-60.3						20	14,794	-59.3		28	15,142	-72.1	
100---	21	16,298	-67.3		15	16,091	-56.2		27	16,211	-62.2		25	16,227	-62.7						13	16,182	-59.3		24	16,437	-75.8	
80---	19	17,642	-66.9		14	17,504	-57.7		26	17,589	-63.1		23	17,598	-62.2						11	17,574	-59.3		19	17,714	-76.1	
60---	14	19,391	-63.2		12	19,316	-56.9		22	19,366	-60.4		17	19,385	-60.8										14	19,392	-68.2	
40---	14	20,516	-61.3		10	20,470	-56.8		21	20,503	-58.5		11	20,518	-60.0										13	20,499	-64.0	
30---	10	21,916	-59.6		11	21,887	-55.3		17	21,900	-56.9														10	21,890	-60.3	
									12	23,748	-53.9														8	23,687	-56.1	

MIDLAND, TEX. ( 919 MB.)				NANTUCKET, MASS. (1014 MB.)				NASHVILLE, TENN. (1000 MB.)				NORTH PLATTE, NEBR. (917 MB.)				OAKLAND, CALIF. (1023 MB.)				OKLAHOMA CITY, OKLA. (973 MB.)				OMAHA, NEBR. ( 980 MB.)				
SURFACE	31	871	4.6	47	31	14	5.5	77	31	177	3.7	74	31	848	- 2.7	78	31	6	11.3	72	31	391	3.1	69	31	300	- 0.5	70
1,000---	31	168			31	125	5.9	69	31	172	4	62	31	150			31	197	12.2	60	31	165			31	140		
950---	31	595			31	543	3.8	67	31	592	3.2	57	31	567			31	630	11.4	49	31	585	4.5	59	31	552	- .6	63
900---	31	1,039	7.0	39	31	981	1.5	64	31	1,027	1.8	53	31	995	- .6	65	31	1,077	10.4	40	31	1,022	3.0	51	31	983	- .8	58
850---	31	1,508	5.6	36	31	1,439	- 7	58	31	1,487	- 8	44	31	1,453	- 4	55	31	1,551	8.5	32	31	1,483	1.7	45	31	1,439	- 1.6	55
800---	31	2,001	3.6	35	31	1,922	- 2.0	46	31	1,973	- 1	40	31	1,936	- 2.8	52	31	2,049	6.0	32	31	1,971	- .5	41	31	1,920	- 3.6	50
750---	31	2,529	1.0	32	31	2,442	- 4.3	43	31	2,491	- 1.9	40	31	2,448	- 5.8	53	31	2,582	3.4	31	31	2,486	- 1.6	40	31	2,430	- 5.9	49
700---	31	3,074	- 1.6	31	31	2,976	- 6.5	42	31	3,034	- 4.3	37	31	2,982	- 8.7	48	31	3,131	- 1	34	31	3,033	- 4.2	35	31	2,965	- 8.7	50
650---	31	3,664	- 5.2	31	31	3,557	- 9.7	43	31	3,621	- 7.3	38	31	3,563	-12.0	45	31	3,722	- 3.7	37	31	3,621	- 7.5	34	31	3,541	-12.0	49
600---	31	4,284	- 9.0	27	31	4,164	-13.1	42	31	4,234	-11.2	38	30	4,150	-15.4	45	31	4,348	- 7.6	37	31	4,232	-11.4	34	31	4,144	-15.4	46
550---	31	4,955	-13.4		31	4,824	-17.3	43	31	4,902	-15.4		30	4,814	-19.6	43	31	5,017	-12.2	36	30	4,899	-15.8	32	31	4,796	-19.7	43
500---	31	5,669	-18.5		30	5,527	-21.8	43	31	5,610	-19.9		30	5,513	-24.2	42	31	5,740	-17.5	38	30	5,603	-20.9	32	31	5,497	-24.4	41
450---	31	6,455	-24.2		30	6,302	-26.7	43	30	6,398	-24.6		30	6,279	-29.7	41	31	6,527	-22.9	36	30	6,388	-26.7		30	6,261	-29.9	40
400---	30	7,296	-30.4		30	7,136	-32.2	42	30	7,237	-30.1		30	7,101	-35.9		31	7,374	-29.1	35	30	7,211	-32.3		30	7,084	-35.9	42
350---	30	8,232	-36.7		29	8,080	-38.1		30	8,173	-36.6		30	8,015	-42.3		31	8,312	-36.6		30	8,140	-38.6		30	7,965	-42.1	
300---	30	9,284	-42.6		29	9,125	-44.6		30	9,225	-43.3		30	9,041	-48.7		31	9,360	-44.9		30	9,183	-45.1		30	9,028	-48.2	
250---	30	10,494	-49.9		29	10,327	-51.0		30	10,430	-50.1		30	10,220	-54.4		31	10,553	-53.9		30	10,382	-51.3		28	10,222	-53.3	
200---	30	11,934	-54.2		28	11,760	-56.0		30	11,869	-55.2		29	11,6														



# RADIOSONDE DATA

Average monthly values

Table 20--Continued

DECEMBER 1953

SANTA MARIA, CALIF. (1013 MB.)				S. STE. MARIE, MICH. (984 MB.)				SPOKANE, WASH. (935 MB.)				SWAN ISLAND, W. I. (1014 MB.)				TACUBAYA, MEXICO (774 MB.)				TAMPA, FLA. (1020 MB.)				TATOOSH ISLAND, WASH. (1015 MB.)			
Standard pressure surface (mb.)																											
Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE 31	71	10.2	64	29	221	- 2.7	88	31	722	0.6	86	31	10	25.7	81	31	2,306	14.5	52	31	7	16.2	52	31	31	8.0	85
1,000-- 31	182	13.3	53	29	89			31	176			31	134	25.6	78	31	79			31	178	16.9	77	31	156	7.2	83
950---- 31	616	13.1	36	29	498	- 4.0	79	31	593			31	585	22.2	81	31	539			31	615	15.4	72	31	581	5.0	81
900---- 31	1,067	11.3	29	29	921	- 5.8	81	31	1,026	- 9	77	31	1,053	19.1	79	31	1,015			31	1,072	13.2	70	31	1,016	2.3	79
850---- 31	1,542	9.6	26	29	1,367	- 7.6	76	31	1,485	- 3	67	31	1,543	16.1	76	31	1,504			31	1,552	11.3	66	31	1,476	- 1	75
800---- 31	2,043	7.5		29	1,837	- 9.3	71	31	1,968	- 2.7	63	31	2,057	13.6	68	31	2,030			31	2,057	9.4	57	31	1,959	- 2.1	67
750---- 31	2,578	4.9	24	29	2,340	-11.3	64	31	2,481	- 5.4	59	31	2,604	11.6	54	31	2,581	12.7	51	31	2,597	7.2	51	31	2,476	- 4.8	61
700---- 31	3,130	1.5	28	29	2,861	-13.7	56	31	3,016	- 8.6	59	31	3,174	9.1	43	31	3,151	8.5	53	31	3,156	4.8	45	31	3,009	- 7.8	60
650---- 31	3,727	- 2.0	27	29	3,428	-16.9	56	31	3,591	-12.2	59	31	3,792	6.2	33	31	3,764	3.8	60	31	3,764	1.9	36	31	3,596	-11.0	58
600---- 31	4,355	- 5.6		29	4,017	-20.1	57	31	4,195	-16.0	56	31	4,437	2.7	32	31	4,404	- 4	58	31	4,398	- 1.7	39	30	4,199	-14.2	57
550---- 31	5,033	-10.2		29	4,660	-23.9	54	31	4,848	-19.8	54	31	5,140	- 1.5	35	31	5,099	- 4.4	45	31	5,090	- 5.9	29	29	4,858	-18.4	56
500---- 31	5,739	-15.6		29	5,346	-28.6	51	30	5,550	-24.0	53	31	5,889	- 6.0	33	30	5,841	- 9.1	37	31	5,825	-10.7	36	29	5,559	-22.9	54
450---- 31	6,554	-21.4		29	6,100	-33.6	49	30	6,316	-29.2	49	31	6,716	-11.4		30	6,656	-14.1		29	6,642	-16.3	39	28	6,329	-28.4	55
400---- 31	7,402	-28.2		29	6,910	-39.0		29	7,139	-35.4	50	30	7,600	-17.5		28	7,533	-19.9		27	7,507	-22.2	43	28	7,157	-34.4	56
350---- 31	8,344	-35.9		28	7,813	-44.9		29	8,055	-42.0		30	8,585	-24.6		27	8,510	-26.7		25	8,482	-28.8	41	28	8,077	-41.2	
300---- 31	9,397	-44.0		28	8,831	-49.6		29	9,082	-48.8		30	9,687	-33.1		25	9,602	-35.1		21	9,582	-37.0		28	9,107	-48.0	
250---- 31	10,594	-53.3		28	10,015	-52.4		29	10,260	-55.3		30	10,940	-43.2		16	10,847	-44.4		18	10,822	-46.6		28	10,289	-55.2	
200---- 31	12,005	-59.9		26	11,469	-52.8		28	11,679	-57.5		30	12,404	-54.9		8	12,290	-55.4		16	12,270	-57.3		26	11,702	-57.9	
175---- 31	12,836	-61.0		21	12,321	-52.3		28	12,524	-56.0		30	13,244	-61.4						12	13,102	-62.2		25	12,546	-56.6	
150---- 30	13,794	-61.0		19	13,318	-52.2		28	13,506	-54.8		28	14,187	-68.3						11	14,047	-66.9		23	13,526	-55.2	
125---- 30	14,921	-62.7		8	14,534	-52.6		27	14,670	-54.8		26	15,264	-73.5						10	15,137	-70.9		21	14,679	-54.7	
100---- 30	16,288	-64.6						26	16,095	-54.4		26	16,552	-77.7						10	16,444	-74.6		20	16,098	-54.7	
80---- 30	17,649	-64.9						25	17,522	-54.0		19	17,815	-79.0						7	17,735	-76.4		17	17,530	-52.6	
60---- 29	19,412	-62.1						22	19,367	-52.9		17	19,479	-70.6						5	19,403	-72.9		11	19,390	-50.3	
50---- 27	20,547	-59.3						18	20,539	-51.4		16	20,575	-64.0										7	20,568	-49.6	
40---- 21	21,946	-57.5						15	21,989	-50.0		16	21,958	-59.2													
30---- 14	23,766	-55.1										16	23,774	-56.2													
20---- 6	26,362	-53.5										9	26,389	-50.5													

VERACRUZ, MEXICO (1015 MB.)				WASHINGTON, D.C. (1008 MB.)			
Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE 28	13	21.9	78	31	88	4.5	66
1,000-- 28	145	20.9	78	31	149	4.5	60
950---- 28	585	18.4	74	31	573	4.6	59
900---- 28	1,050	16.2	68	31	1,008	2.8	58
850---- 28	1,535	14.4	61	31	1,470	1.1	54
800---- 28	2,045	12.4	58	31	1,956	- 4	48
750---- 28	2,588	9.8	60	31	2,478	- 2.2	45
700---- 28	3,155	7.1	57	31	3,015	- 5.3	42
650---- 27	3,765	4.0	48	31	3,601	- 8.4	36
600---- 25	4,407	.6	35	30	4,207	-12.2	37
550---- 24	5,100	- 3.2		30	4,871	-16.0	32
500---- 22	5,847	- 8.2		30	5,579	-20.1	
450---- 22	6,665	-13.7		30	6,362	-25.0	
400---- 22	7,543	-19.6		30	7,199	-30.7	
350---- 21	8,522	-25.9		30	8,134	-36.8	
300---- 21	9,621	-34.1		30	9,186	-43.2	
250---- 20	10,869	-44.3		30	10,393	-50.2	
200---- 14	12,327	-56.3		29	11,830	-55.4	
175---- 13	13,164	-62.4		28	12,673	-56.9	
150---- 11	14,105	-68.3		27	13,646	-57.8	
125---- 7	15,195	-73.3		26	14,787	-59.3	
100----				22	16,161	-60.5	
80----				18	17,546	-59.8	
60----				13	19,333	-58.6	
50----				13	20,479	-58.1	
40----				13	21,887	-57.2	
30----				10	23,687	-56.2	

Note: All observations scheduled at 0300, G.C.T. except at Mazatlan, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and

expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

# PILOT BALLOON DATA

Average monthly resultant winds

Table 21

DECEMBER 1953

Altitude (meters) m.a.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)					
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed						
Surface-----	31	262	3.4	31	333	1.1	30	257	6.0	31	287	4.0	29	50	0.6	30	253	0.2	28	233	6.9	31	202	2.3	28	260	1.0	28	217	4.5	31	278	2.1	31	347	3.5			
500-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
1,000-----	30	248	3.8	---	---	---	---	---	---	30	294	9.0	29	111	---	28	252	1.1	28	244	9.0	31	211	5.8	27	247	3.3	28	224	5.5	---	---	---	---	---				
1,500-----	29	266	5.0	---	---	---	---	---	---	30	272	11.0	24	300	13.1	28	290	2.7	19	280	3.5	14	249	15.8	11	258	11.2	19	271	10.3	16	261	11.3	30	281	3.7	31	343	3.4
2,000-----	27	270	6.8	31	318	2.4	29	289	12.4	21	304	13.3	24	289	6.6	16	259	5.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
2,500-----	27	269	8.8	31	311	5.5	28	295	13.0	18	302	13.9	17	311	8.0	15	268	8.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
3,000-----	26	267	10.5	29	306	6.3	24	300	13.0	16	304	14.8	14	311	8.5	14	268	9.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
4,000-----	24	273	13.0	27	310	8.4	19	310	15.5	15	303	15.7	12	320	10.5	12	269	12.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
5,000-----	19	268	16.0	27	314	9.7	16	320	16.2	11	332	16.0	11	334	12.1	11	258	16.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
6,000-----	16	277	18.3	25	297	14.2	15	317	17.2	12	286	17.3	10	339	13.1	10	256	17.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
8,000-----	10	278	26.7	21	316	12.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
10,000-----	---	---	---	16	302	18.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
12,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			

Altitude (meters) m.a.l.	Grand Junction, Colo. (1,475 m.)			Green Bay, Wis. (210 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Little Rock, Ark. (88 m.)			Medford, Ore. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Omaha, Nebr. (306 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed			
Surface-----	31	328	1.5	28	262	2.5	23	254	2.6	28	262	3.0	29	66	0.5	27	226	1.3	22	258	0.3	31	99	2.7	27	6	1.9	30	244	1.8	30	301	1.1	30	284	4.0
500-----	---	---	---	28	266	4.0	23	257	4.2	---	---	---	26	213	2.5	27	245	2.8	22	229	6	31	99	2.2	26	332	1.3	30	224	3.4	30	359	2.6	30	280	5.0
1,000-----	---	---	---	25	266	8.1	23	262	7.1	27	282	11.2	23	224	4.4	24	265	5.5	21	196	1.7	29	128	1.1	23	305	3.0	25	222	5.8	29	354	4.3	26	283	7.3
1,500-----	31	328	1.5	22	267	10.7	22	275	9.8	27	282	11.2	20	265	7.1	22	279	7.8	17	231	3.1	27	193	1.2	21	286	5.3	21	246	7.1	28	353	6.0	23	289	9.4
2,000-----	31	325	1.9	19	274	11.8	22	280	11.9	25	284	11.5	18	266	9.5	21	279	11.6	10	242	3.3	22	251	1.8	18	282	8.2	19	264	9.4	28	350	6.7	18	289	12.5
2,500-----	30	288	2.2	18	275	11.8	22	275	13.7	21	281	13.2	18	265	10.3	21	275	13.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3,000-----	29	297	3.8	16	275	13.5	20	272	15.8	21	290	14.7	16	274	12.7	20	282	15.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4,000-----	26	317	7.8	11	280	15.8	19	270	18.4	15	302	18.9	14	266	16.0	13	269	16.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
5,000-----	23	321	12.6	10	294	18.5	15	281	24.4	---	---	---	11	269	19.1	11	251	22.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6,000-----	17	321	16.0	---	---	---	---	---	---	---	---	---	11	267	25.0	10	255	24.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8,000-----	13	322	13.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m.a.l.	Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (725 m.)			* Washington, D.C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface-----	31	344	0.5	31	320	3.7	27	281	2.3	30	242	3.1	27	310	0.7	31	289	2.7	30	249	1.0	25	202	3.5	22	224	3.2	31	248	2.2
500-----	31	354	7	---	---	---	27	284	4.7	30	239	5.7	27	307	8	31	333	1.8	29	255	4.0	25	202	5.6	---	---	---	31	246	6.6
1,000-----	31	36	1.0	31	321	4.4	23	303	10.1	23	254	8.8	24	294	2.4	31	28	2.4	28	266	7.7	16	215	7.0	22	227	6.0	31	255	9.4
1,500-----	31	22	1.2	30	318	8.9	23	306	12.4	23	267	12.2	22	271	3.8	31	19	3.6	26	274	9.0	12	217	8.1	19	251	6.7	31	259	11.9
2,000-----	31	353	2.2	28	318	9.8	22	301	13.3	23	271	14.0	21	253	6.3	30	14	4.7	25	276	10.6	12	228	7.4	16	269	7.1	30	267	13.3
2,500-----	30	348	3.3	26	316	11.7	20	302	14.0	20	270	13.6	20	257	8.4	30	4	5.8	25	277	12.6	12	240	7.1	14	288	9.0	29	265	15.7
3,000-----	29	349	5.0	22	320	13.4	18	301	14.9	19	277	14.3	20	259	10.0	30	356	7.3	25	275	14.3	11	240	9.0	12	294	11.0	29	265	18.5
4,000-----	28	328	8.6	14	317	16.0	16	304	16.6	19	275	16.6	19	262	16.1	29	338	9.7	26	279	17.0	---	---	---	---	---	---	30	262	22.7
5,000-----	27	318	11.7	11	310	17.2	15	301	16.6	19	276	18.0	17	259	18.5	26	327	12.4	26	276	17.9	---	---	---	---	---	---	26	260	25.3
6,000-----	24	310	13.0	10	313	15.5	10	303	21.8	15	281	19.4	15	261	21.6	23	317	12.3	26	272	22.5	---	---	---	---	---	---	28	260	30.0
8,000-----	13	311	14.8	---	---	---	---	---	---	14	286	25.2	---	---	---	16	331	12.8	25	265	29.3	---	---	---	---	---	---	29	262	39.1
10,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	14	310	12.8	24	266	35.0	---	---	---	---	---	---	27	262	47.6
12,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	11	295	18.3	20	265	29.5	---	---	---	---	---	---	26	265	49.2
14,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	21	267	43.3
16,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	17	265	29.4

\* Rawin Data (Cont'd)  
18,000 m., 14 obs. 266 dir., 20.7 speed  
20,000 m., 11 obs. 267 dir., 9.2 speed

† Rawin Data

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.: directions in degrees from north (N = 360°, E = 90°, S = 180°).

W = 270°; speeds in meters per second.



# RAWIN DATA

Average monthly resultant winds

DECEMBER 1953

Table 22

	Albuquerque, N. Mex. (1,636 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrowood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N.C. (3m.)			Int. Falls, Minn. (358 m.)			Little Rock, Ark. (80 m.)			
Altitude (meters) m.s.l.	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed					
Surface-----	31	27	1.4	31	301	1.2	31	331	1.0	31	50	2.4	31	943	2.4	30	257	0.8	31	217	1.9	31	1	1.0	31	259	1.6	29	261	2.3	30	261	1.7	31	223	1.0	
500-----	---	---	---	---	---	---	30	191	1.3	31	67	1.9	31	258	4.6	30	232	3.5	30	238	5.4	---	---	---	---	31	257	4.9	28	261	6.0	29	279	3.1	31	229	3.8
1,000-----	---	---	---	31	298	7.5	30	199	2.0	31	141	6	31	264	7.6	30	246	5.7	29	258	8.5	---	---	---	---	30	260	7.0	28	261	8.0	29	207	6.2	30	254	5.5
1,500-----	---	---	---	31	309	9.6	31	240	3.7	30	237	2.9	30	277	9.8	30	252	7.3	29	270	9.3	29	19	5	29	259	8.3	27	262	10.1	30	313	7.6	26	282	6.5	
2,000-----	31	313	3.9	31	310	10.2	31	242	5.8	30	245	5.9	30	279	11.9	29	258	9.6	29	277	10.5	29	275	8	29	259	10.1	26	263	11.1	30	314	8.6	24	284	8.6	
2,500-----	31	307	7.5	31	311	11.6	31	239	7.0	29	239	8.1	30	271	13.3	29	258	12.7	29	281	11.7	29	282	1.8	29	260	11.8	24	261	13.3	29	313	9.7	24	280	10.1	
3,000-----	31	307	8.7	29	310	12	31	246	9.3	29	241	10.5	28	267	14.6	27	257	14.6	29	276	12.9	30	310	5.0	29	255	14.6	23	262	15.1	29	314	11.4	24	275	12.4	
4,000-----	31	310	8.9	28	308	13.3	29	254	11.6	29	251	17.0	26	272	18.1	22	255	17.4	28	274	15.5	30	330	8.3	24	258	16.3	20	263	17.6	28	304	14.1	23	271	15.1	
5,000-----	29	307	9.9	26	301	17.7	29	247	15.1	27	242	19.5	25	266	21.4	18	255	20.6	26	279	18.3	30	328	12.8	24	257	21.6	18	259	21.5	26	289	16.2	19	272	16.7	
6,000-----	24	313	9.8	18	294	14.9	26	246	18.2	27	243	23.0	20	256	22.7	13	257	20.4	26	278	19.6	30	326	15.2	23	256	25.3	10	259	21.3	23	283	17.9	14	247	21.9	
8,000-----	18	290	13.6	14	283	16.0	17	249	26.7	23	247	27.1	11	250	21.3																						
10,000-----	12	287	13.3							13	251	36.8																									
12,000-----																																					
14,000-----																																					
16,000-----																																					
18,000-----																																					
20,000-----																																					
22,000-----																																					
24,000-----																																					

	Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Midland, Tex. (871 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma, City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			Santa Maria, Calif. (72 m.)			
Altitude (meters) m.s.l.	No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			No. of observations			
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed					
Surface-----	31	283	0.6	31	72	1.6	31	222	0.7	29	264	3.0	31	220	1.4	31	10	0.4	31	197	1.6	31	307	2.6	31	292	1.4	31	18	1.0	31	88	3.4	31	17	2.1	
500-----	29	296	8.3	31	106	3.8	---	---	---	29	250	10.1	29	222	4.8	31	351	3.9	26	246	2.2	---	---	---	---	31	296	3.5	31	58	1.5	31	81	7.7	31	28	6.0
1,000-----	29	257	1.3	31	118	3.5	30	224	1.4	28	260	11.0	29	236	6.4	31	357	5.2	26	284	4.8	31	306	3.1	31	302	6.3	31	196	4.4	31	80	8.2	31	23	7.7	
1,500-----	30	261	3.6	31	155	1.0	30	262	3.4	28	257	12.7	29	261	8.4	31	349	5.9	26	291	6.5	31	308	9.9	31	298	8.3	30	245	3.6	31	79	7.5	31	12	8.2	
2,000-----	30	283	5.9	30	234	2.0	30	275	5.1	26	260	13.7	30	256	10.5	31	345	6.8	27	287	7.8	31	315	12.4	30	299	9.9	30	245	6.9	31	71	7.2	31	2	9.5	
2,500-----	31	289	9.3	30	231	3.8	30	276	7.1	26	260	16.6	29	258	11.7	31	338	8.9	28	284	8.9	31	315	13.3	29	300	10.3	30	248	8.4	31	73	7.6	31	354	10.8	
3,000-----	31	295	11.1	30	237	5.3	30	281	8.5	24	266	19.5	29	263	14.1	30	339	10.5	27	279	9.5	31	316	13.9	29	300	11.4	30	242	10.3	31	71	7.9	31	352	12.2	
4,000-----	30	300	13.0	30	236	8.3	31	275	11.4	18	266	21.3	29	262	18.4	28	331	13.1	27	272	12.6	27	310	15.1	27	289	12.0	30	255	13.6	30	66	7.8	27	341	10.1	
5,000-----	29	303	16.5	29	247	10.1	30	273	13.5	12	254	27.0	25	260	22.2	25	320	13.4	25	266	13.6	23	307	16.0	27	282	14.5	29	257	16.0	30	52	6.3	26	324	11.1	
6,000-----	23	291	18.6	28	248	13.5	27	266	14.9				20	260	25.2	22	305	13.2	24	266	15.4	20	312	16.4	26	288	14.9	27	252	19.3	30	36	5.8	23	320	11.3	
8,000-----	12	283	13.8	27	256	19.6	23	252	20.7				10	256	20.2	14	301	11.6	19	253	20.2	14	300	15.9	23	280	19.4	22	250	26.0	30	2	7.4	22	319	15.9	
10,000-----				24	259	27.8	19	271	22.0							13	304	16.5	15	253	26.8	11	287	16.7	18	267	21.7	16	253	29.5	30	338	12.2	19	309	17.4	
12,000-----				22	266	31.3	18	258	25.9																												
14,000-----				15	267	30.9	13	259	25.9																												
16,000-----																																					
18,000-----																																					
20,000-----																																					
22,000-----																																					
24,000-----																																					

	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Is., Wash. (33 m.)			Washington, D.C. (88 m.)		
Altitude (meters) m.s.l.	No. of observations			No. of observations			No. of observations			No. of observations		
	Direction	Speed		Direction	Speed		Direction	Speed		Direction	Speed	
Surface-----	30	217	1.3	31	199	2.6	31	193	3.4	31	229	1.6
500-----	30	251	4.0	---	---	---	31	222	7.0	31	252	7.3
1,000-----	30	267	7.2	31	218	6.2	27	237	7.3	31	271	9.3
1,500-----	30	275	8.2	28	246	8.0	23	257	8.0	31	269	10.5
2,000-----	30	278	9.5	27	260	8.6	23	257	8.9	31	265	12.9
2,500-----	29	271	13.8	27	273	8.8	22	266	9.5	31	261	14.8
3,000-----	29	271	15.0	27	283	10.8	22	273	11.8	31	260	17.4
4,000-----	29	269	16.8	28	303	13.5	20	281	15.4	30	256	21.4
5,000-----	29	271	18.8	28	304	17.0	16	285	15.4	30	258	25.9
6,000-----	29	269	22.6	20	304	20.1	14	280	16.4	30	255	28.9
8,000-----	27	266	31.8	10	329	17.9	10	274	21.5	28	259	38.1
10,000-----	27	264	35.8							27	260	46.3
12,000-----	22	262	28.9							25	260	45.8

# SOLAR RADIATION DATA

Table 30 Solar radiation intensities, tabulated in langley's per minute on a surface normal to the direction of the sun.

DECEMBER 1953

Date	Sun's zenith distance								
	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
TABLE MOUNTAIN, CALIF.									
Air mass									
	3.76	3.01	2.26	1.51	*1.0	1.51	2.26	3.01	3.76
Dec.				1.42					
8-----				1.50					
13-----	1.17	1.26	1.36	1.50					
14-----	1.16	1.26	1.36	1.49					
21-----				1.50					
22-----				1.52					
26-----				1.46					
28-----				1.48					
29-----				1.46					
30-----				1.50					
31-----				1.51					
Averages	1.16	1.26	1.36	1.48					
Departures	-.07	-.06	-.06	-.06					
LINCOLN, NEBR.									
Air mass									
	4.77	3.81	2.86	1.91	*1.0	1.91	2.86	3.81	4.77
Dec.									
4-----	0.72	0.89	1.04				1.16	1.03	0.90
9-----	.83	.94	1.11				1.14	1.01	.92
10-----	.85	.94	1.09						
11-----	.83	.96	1.11						
14-----	.85	.98	1.11						
18-----	.72	.80	.90				1.05	.92	.83
19-----	.73	.86	1.03				1.09	.99	.90
22-----							1.15	.98	.89
26-----	.94	1.02	1.15						
28-----	.85	1.00	1.13				1.14	1.01	.90
Averages	.81	.93	1.08				1.12	.99	.89
Departures	-.12	-.13	-.12				-.03	-.04	-.05
BOSTON, MASS.									
Air mass									
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96
NO DATA DURING DECEMBER 1953									
MADISON, WIS.									
Air mass									
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81
NO DATA DURING DECEMBER 1953									

		Sun's zenith distance							
Date	A. M.				0.0°	P. M.			
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°
ALBUQUERQUE, N. MEX.									
Air mass									
	4.08	3.26	2.44	1.63	*1.0	1.63	2.44	3.26	4.08
Dec.									
1-----				1.37					
2-----	0.88						1.14		
5-----								1.14	
6-----	.99	1.11	1.22	1.41		1.41	1.26	1.14	1.05
7-----	1.02	1.11	1.24						
9-----	.93	1.08	.99	1.38		1.38		1.14	1.07
10-----	.99	1.10	1.22	1.39		1.42	1.29	1.07	
11-----						1.29	1.13	.99	.86
12-----		1.11	1.22						
13-----						1.43	1.04	1.13	1.01
14-----	1.02	1.11	1.22	1.41		1.41	1.25	1.10	1.02
15-----		1.15	1.26	1.42			1.27	1.13	1.03
19-----	.83	.94	1.11	1.29		1.20	1.17	1.05	.95
20-----			1.22			1.38	1.20	1.08	1.00
21-----	.99	1.12	1.23				1.22	1.10	.99
22-----				1.33		1.33	1.16	1.01	.88
23-----	.94	1.01	1.17	1.32		1.12	1.08	1.03	.94
24-----	1.04	1.14	1.27	1.40		1.38	1.17	1.07	.95
25-----	1.01	1.12	1.21						
26-----								1.11	1.00
27-----	.98								
28-----	.89	.98	1.17	1.37		1.33	1.18	1.04	.91
29-----	.99	1.07	1.19	1.28		1.25	1.16	1.02	.89
30-----	.99	1.03	1.19	1.35		1.37	1.16	1.06	.94
31-----	1.07	1.16	1.26	1.39		1.38	1.25	1.12	1.03
Aver-	.97	1.08	1.19	1.36	----	1.34	1.18	1.08	.97
ages									
Departures	-.04	-.03	-.04	-.01	----	-.04	-.06	-.04	-.07
BLUE HILL, MASS.									
Air mass									
	4.86	3.89	2.92	1.94	*1.0	1.94	2.92	3.89	4.86
Dec.									
2-----							1.17	1.06	1.00
5-----	0.78	1.10	1.23						
17-----	.95	1.05	1.17						
18-----	.99	1.09	1.17						
24-----							1.16	.98	.86
25-----	.88	.99	1.13				1.11		
26-----	.90	1.00	1.13				1.15		
27-----	1.03	1.11	1.25				1.23	1.09	.99
31-----							1.23		
Aver-	.93	1.03	1.18		----	----	1.18	1.04	.95
ages									
Departures	+.01	-.01	+.02		----	----	+.03	+.01	.00
* Extrapolated									

Langley is the unit used to denote one gram calorie per square centimeter. An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of

pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.



# SOLAR RADIATION DATA

DECEMBER 1953

**Table 31a** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

	Avg								Avg								Avg
Date-----	3	4	5	6	7	8	9		10	11	12	13	14	15	16		
Langleys-----	62	57	66	55	49	91	48	58	34	57	38	52	13	55	62	45	58
Date-----	24	25	26	27	28	29	30	31	Avg								
Langleys-----	80	63	58	67	34	79	65	64	64								

**Table 31b** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing east at Blue Hill, Mass. during the month

	Avg								Avg								Avg
Date-----	3	4	5	6	7	8	9		10	11	12	13	14	15	16		
Langleys-----	158	68	123	87	56	168	40	100	31	171	31	148	11	85	108	84	110
Date-----	24	25	26	27	28	29	30	31	Avg								
Langleys-----	155	176	163	172	22	133	116	167	138								

**Table 31c** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

	Avg								Avg								Avg
Date-----	3	4	5	6	7	8	9		10	11	12	13	14	15	16		
Langleys-----	378	100	314	111	320	469	90	248	53	478	28	455	9	254	335	230	276
Date-----	24	25	26	27	28	29	30	31	Avg								
Langleys-----	449	465	464	522	17	256	308	432	364								

**Table 31d** Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing west at Blue Hill, Mass. during the month

	Avg								Avg								Avg
Date-----	3	4	5	6	7	8	9		10	11	12	13	14	15	16		
Langleys-----	98	50	142	47	161	167	34	99	48	132	26	131	10	126	118	84	86
Date-----	24	25	26	27	28	29	30	31	Avg								
Langleys-----	163	114	129	165	18	82	114	116	113								

**Table 31e** Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

	Avg								Avg								Avg
Date-----	3	4	5	6	7	8	9		10	11	12	13	14	15	16		
Langleys-----	49	71	52	69	39	42	45	52	34	37	43	33	11	60	58	39	60
Date-----	24	25	26	27	28	29	30	31	Avg								
Langleys-----	63	43	45	34	33	89	66	50	53								

Note: Langley is the unit used to denote one gram calorie per square centimeter.

# SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleyes

[illegible]

Accumulated Departures January 1 to December 31, 1953

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.



## SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langley-inches, tabulated in langley-inches.—Continued

1953	Lincoln, Nebr.	Little Rock, Ark.	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBGO)	Madison, Wis.	Medford, Ore.	Miami, Fla.	Midland, Tex.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Phoenix, Ariz.	Prosser & NE, Wash.	Rapid City, S. Dak.	Riverside, Calif.	Santa Maria, Calif.	Savville, N. Y.	S. Ste. Marie, Mich.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (U. of W.)	Seattle, Wash. (WBAS)	State College, Pa.	Stillwater, Okla.	Swan Is., W. I.	Tampa, Fla.	Upton, N. Y.	Washington, D. C. (Silver Hill Obs.)	Wake Island, Pacific Area	Winnipeg, Manitoba		
Dec. 3-----	108	239	280	255	14	25	267	400	23	214	168	125	269	33	316	50	138	282	250	207	33	128	241	26	65	225	169	34	310	295	---	---	69		
Dec. 4-----	221	304	356	318	15	136	124	220	235	134	44	17	264	28	114	131	160	222	236	58	40	41	54	57	67	229	278	45	154	284	---	---	123		
Dec. 5-----	115	102	339	300	92	162	345	225	218	217	181	273	130	33	347	90	206	242	336	31	340	82	54	57	75	237	140	437	274	218	---	---	143		
Dec. 6-----	226	310	349	304	71	39	373	355	197	137	83	31	331	22	337	136	85	338	332	95	18	47	64	17	26	36	331	447	377	115	---	---	35		
Dec. 7-----	205	300	304	271	155	100	306	353	287	159	205	284	329	82	336	163	86	305	311	201	76	115	220	106	13	218	242	438	257	272	---	---	116		
Dec. 8-----	175	160	324	269	173	47	286	305	263	219	193	240	---	(151)	301	37	171	327	325	214	39	170	220	106	13	212	276	268	313	228	---	---	116		
Dec. 9-----	214	237	306	278	45	60	274	358	70	145	100	2	327	33	333	43	104	313	(324)	127	81	43	147	19	---	43	342	425	356	152	---	---	118		
Averages-----	181	237	323	285	82	80	282	316	192	175	145	139	275	(53)	297	93	(136)	301	(316)	159	(90)	89	170	42	27	141	268	358	292	174	---	---	(78)		
Departures-----	+8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Dec. 10-----	201	297	320	282	153	161	350	363	263	54	98	132	302	21	338	166	122	323	322	75	117	64	148	71	99	86	320	377	180	95	226	---	---	59	
Dec. 11-----	212	60	270	247	137	179	264	206	59	221	179	57	139	141	334	75	177	320	315	203	49	155	198	74	11	209	144	433	254	207	214	232	104	232	
Dec. 12-----	204	199	324	284	181	374	368	344	141	59	34	33	317	41	330	154	149	325	320	49	59	76	38	36	92	54	313	351	69	15	231	124	104	232	
Dec. 13-----	99	193	334	294	40	(42)	363	333	55	205	171	28	289	(160)	343	143	195	330	324	112	72	163	145	93	79	173	270	337	194	---	---	130	231	88	
Dec. 14-----	202	162	324	263	(92)	35	268	358	69	19	10	20	302	33	340	96	88	330	321	9	24	32	107	24	38	23	290	116	305	---	---	---	150	70	130
Dec. 15-----	140	217	209	197	113	35	325	275	283	155	115	219	289	(162)	318	84	183	222	147	139	125	81	141	66	84	153	150	257	390	138	150	184	127	114	125
Dec. 16-----	136	294	286	255	226	(85)	395	328	149	197	159	146	230	196	(153)	61	199	202	242	162	201	133	171	35	111	151	314	169	388	182	137	214	125	---	---
Averages-----	171	203	295	253	(134)	(98)	333	315	146	130	109	91	268	(108)	(309)	111	159	293	284	107	92	101	135	57	73	122	258	304	295	138	134	214	100	100	---
Departures-----	+8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Dec. 17-----	167	190	244	214	205	41	355	264	267	220	218	282	234	(218)	309	111	229	222	167	207	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Dec. 18-----	323	265	241	168	32	314	106	260	214	162	218	272	177	(151)	187	67	184	283	288	180	126	105	205	97	50	109	173	255	421	170	197	233	152	152	---
Dec. 19-----	211	259	257	235	181	87	327	278	269	119	134	259	98	59	317	28	159	276	287	115	79	68	202	49	18	96	76	393	341	135	236	175	100	100	---
Dec. 20-----	68	113	265	243	36	135	339	300	223	136	71	185	59	(35)	288	128	32	294	312	98	66	48	114	98	74	88	56	(334)	239	126	151	230	38	38	---
Dec. 21-----	24	67	339	286	35	144	306	55	147	81	7	159	47	(341)	163	95	327	326	91	40	128	76	51	104	68	58	224	330	128	85	150	97	97	---	
Dec. 22-----	214	133	317	282	131	20	147	177	72	135	88	53	250	23	(341)	163	223	338	331	64	94	57	79	55	95	53	267	403	296	126	113	138	139	---	
Dec. 23-----	218	302	334	290	266	79	249	378	271	156	199	69	325	(170)	342	39	78	327	327	179	180	118	181	35	42	72	355	377	58	185	208	201	86	---	
Averages-----	157	207	287	256	129	90	268	257	203	161	138	161	186	(100)	(304)	100	143	295	291	133	97	100	144	61	65	86	175	(331)	297	152	173	202	104	---	
Departures-----	-9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Dec. 24-----	323	303	321	271	179	158	216	355	294	214	158	291	395	93	342	36	187	329	319	142	75	111	201	21	68	168	348	345	161	172	239	214	100	---	
Dec. 25-----	220	305	323	276	186	73	277	186	271	268	214	282	191	308	24	345	37	187	327	288	192	80	89	158	29	37	176	339	398	443	212	243	231	57	---
Dec. 26-----	121	291	323	280	104	55	265	229	262	215	158	286	270	24	355	37	98	310	297	208	82	79	189	70	19	111	328	443	433	204	(147)	227	98	---	
Dec. 27-----	212	114	259	298	65	51	362	209	202	232	219	186	148	141	385	179	128	312	296	225	39	174	161	44	35	140	187	413	426	217	201	195	165	---	
Dec. 28-----	232	149	303	252	185	106	269	276	25	41	31	32	315	60	298	126	127	301	227	225	22	118	98	37	41	8	352	---	---	---	---	---	---	---	
Dec. 29-----	135	240	270	233	115	88	347	348	---	93	45	12	301	83	330	167	158	317	313	60	60	138	98	78	52	124	323	377	340	116	80	214	143	---	
Dec. 30-----	189	173	308	271	168	58	318	354	69	98	117	113	321	153	348	151	183	327	306	137	193	73	79	49	30	52	144	350	---	---	---	---	---	---	
Dec. 31-----	209	327	327	286	85	37	275	---	293	205	157	258	317	(129)	350	37	127	343	320	143	137	95	165	26	26	55	359	452	350	161	244	218	77	---	
Averages-----	190	240	300	261	136	78	304	371	293	165	136	171	288	(90)	309	103	145	316	(309)	142	103	93	136	39	38	99	321	405	305	161	(145)	211	103	---	
Departures-----	+28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Accumulated Departures January 1 to December 31, 1953

Note.—Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

# ILLUMINATION DATA

Table 34.-Daily illumination on a horizontal surface, tabulated in hundreds of foot-candle hours.

DECEMBER 1953

Station	Day of month																																Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Baltimore, Md.-----	140	267	250	51	268	52	272	255	108	188	--	22	150	78	206	183	192	213	201	140	132	99	231	242	166	130	189	60	96	74	234	163	
Philadelphia, Pa.-----	54	194	176	44	228	39	214	206	99	126	162	22	147	34	128	108	177	159	170	58	87	27	178	---	---	---	---	---	---	---	---	---	123
Washington, D. C. (WBCO)-----	---	---	---	---	283	45	289	272	95	257	210	23	146	60	183	134	188	228	230	160	122	114	236	240	151	150	---	(561)	(97)	(68)	223	160	

The foot-candle hour is the average illumination for one hour, in foot-candles. Foot-candle hours for a day are obtained by summing the foot-candle hours for the individual hours of that day. The illumination values are compiled from continu-

ous records of the illumination output of a Foster Illuminometer. For a description of this instrument see "A Recording Daylight Illuminometer", by Norman B. Foster, in Illuminating Engineering, Vol. XLVI No. 2, pages 59 to 62.

## CORRECTIONS

Month: January 1953

The highest temperature should be 88°F at Pearl on Jan. 10 1953.

Month: May 1953

The departure from the normal precipitation should be plus (+) 0.53.

Month: September 1953

The lowest temperature should be 12°F at Bondurant on September 25, 1953.

Month: September 6, 1933

Excessive precipitation as published in other bulletins has been corrected as follows:

## MINUTES

5	10	15	20	25	30	35	40	45	50	60	80	100	120
.48	.98	1.44	1.89	2.19	2.42	2.61	2.82	3.04	3.45	4.07	5.20	6.03	6.04

Month: October 1953

The average daily totals for October 29 through November 4 should be 437, 452, 372, 290, 416, 393, 248, average 373.

The average daily totals for October 22-28 should be (250).

Month: June 1953

Second column, 6th line from bottom, "\$12,000,000" should read "\$9,180,000".

Page 3: New Mexico

Page 121: Gasquet RS, California

Page 301: Wyoming

Charleston, S. C.

Page 345: Griffin, Georgia

Page 346: Ottawa, Ontario

Page 166: General Summary



## CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

DELAIED DAT

Section	Temperature								Precipitation							
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes					
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least		
	*F	*F		*F				*F				In.	In.		In.	
June 1953																
Alaska	53.4	+3.0	Lake Nerka	94	26	Crooked Creek	23	6	1.39	-0.14	Windham			5.01	Point Lay	0.06
July 1953																
Alaska	55.9	+1.0	2 stations	91	*25	Barrow WB AP	27	26	1.57	-.81	Ketchikan			8.82	Hughes	.06
Hawaii	73.7	-.6	Puunene CAA AP	94	*4	Kole Kole	37	*3	3.09	-2.16	Kahana			18.81	25 stations	.00
Puerto Rico	79.0	+6	Aguirre	97	21	Guineo Reservoir (4)	61	*8	5.55	-.37	San Lorenzo (Espino)			14.48	San Lorenzo (Valdes Farm)	.78
August 1953																
Alaska	51.4	.0	Allakaket	87	1	Fort Yukon CAA	23	30	4.15	+1.04	Whittier			22.40	Barrow WB AP	.90
Hawaii	74.3	-.3	Kaanapali	92	7	Kole Kole	38	2	3.57	-2.36	Kahana			19.43	15 stations	.00
September 1953																
Alaska	43.0	+4	Beaver Falls	71	4	Anaktuvuk	7	29	2.57	-.22	Whittier			26.70	3 stations	.28
Hawaii	74.1	-.6	Puunene CAA AP	95	*24	Kole Kole	38	11	1.81	-3.23	Kahana			15.18	21 stations	.00
October 1953																
Alaska	25.5	-2.8	Petersburg CAA	67	5	Fort Yukon CAA	-37	31	2.45	-.25	Little Port Walter			45.71	2 stations	.02
Hawaii	73.2	-.5	Puunene CAA AP	95	22	Kole Kole	35	*13	2.65	-3.00	Pepeekeo			15.00	7 stations	.00
November 1953																
Hawaii	71.0	-.8	Puunene CAA AP	91	16	Haleakala RS	40	20	4.45	-2.26	Wakahanaloa 2			27.00	9 stations	.00

## CLIMATOLOGICAL DATA

Table 2

[illegible]

# Max. 70 F. or above for Alaskan stations.  
† Sun below horizon from 19th through the 30th.  
Also see footnotes with current date.

# DEGREE DAYS

(Base 65°F.)

DELAYED DATA

Table 3

State and station	Current season		Normals July through this month	State and station	Current season		Normals July through this month	State and station	Current season		Normals July through this month	State and station	Current season		Normals July through this month
	This month	Period July through this month			This month	Period July through this month			This month	Period July through this month			This month	Period July through this month	
June 1953				September 1953				October 1953				November 1953			
WASHINGTON Stampede Pass	630		9149	ALASKA Anchorage	530	926		ALASKA Anchorage	941	1867		ALASKA Anchorage	1323	3190	
July 1953				Annette Island	352	784		Annette Island	509	1293		Annette Island	671	1964	
WASHINGTON Stampede Pass	301	301	251	Barrow	1022	2792		Barrow	1742	4534		Barrow	1983	6517	
				Bethel	594	1138		Bethel	1121	2259		Bethel	1436	3695	
				Cordova	523	1195		Cordova	787	1982		Cordova	1032	3014	
				Fairbanks	586	987		Fairbanks	1267	2254		Fairbanks	1881	4135	
				Juneau	467	1009		Juneau	668	1677		Juneau	953	2630	
				Kotzebue	671	1567		Kotzebue	1297	2864		Kotzebue	1571	4435	
				McGrath	605	1073		McGrath	1306	2379		McGrath	1868	4247	
				Nome	636	1523		Nome	1139	2662		Nome	1338	4000	
				Northway	730	1234		Northway	1374	2608		Northway	2180	4788	
				St. Paul	599	1548		St. Paul	911	2459		St. Paul	952	3411	
				Yakutat	490	1133		Yakutat	711	1844		Yakutat	990	2834	

## SEVERE STORMS

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
June 1953										
Ironwood (near southern boundary of Porcupine Mountain State Park), Mich.	30		590	10	0	0	\$150,000	\$0	Tornado	Tornado believed to have been type of storm, though not observed, which levelled about 1920 acres of timber in remote region northeast of Ironwood and west of White Pine Mine.
July 1953										
Munising, Alger County, Mich.	6	1-1:15 p.m.			0	0	2,000	0	Waterspout	Waterspout seen on Lake Superior west of Powell's Point heading toward Munising, 3 cars overturned due to wind.
Aug. 1953										
Condon (5 miles south-west and 25 miles east-southeast of), Ore.	19	Late afternoon	*3	30			Negligible	Several thousand	Hail	Heavy hailstorm moved across large section of Gilliam County wheat land, causing from 30 to 100% destruction to unharvested grain. Fortunately most grain was harvested. Storm moved eastward.
Gilliam County (extreme southeast corner), Ore.	19	Afternoon	*2	10			Negligible	Several thousand	do	Much the same as above but occurring in different area and at slightly different time of day.
Sept. 1953										
St. Thomas, V. I.	8	4 a.m.-midnight					275,000		Winds, wave, and rains	A strong easterly wave entered northern part of Caribbean Sea. Gusty winds up to 50 m.p.h. observed at St. Thomas, V.I., Vieques Island, and extreme south-eastern coast of Puerto Rico. Heavy to excessive rains at St. Thomas, V.I. flooded lower areas in town. Damage to property estimated at \$75,000, with an additional \$200,000 needed for cleaning city, repairing roads, bridges, etc.
St. Croix, V. I.	8	4 a.m.-midnight					8,000		Thunderstorms	The only significant damage reported from St. Croix V.I. was to small craft in Fredericksted Harbour, where 3 lighters destroyed and 2 other small boats damaged.
Puerto Rico	8	11:00 a.m.-6:00 p.m.					75,000	200,000	do	Damage in Puerto Rico confined mostly to Yabucoa-Maunabo-Patillas districts, where total damage due to flood waters.
Oct. 1953										
Port Aransas, Nueces County, Tex.	23	3:15 p.m.	100	4	0	0	7,000	0	Tornado	Storm moved south-southeastward. 1 automobile wrecked, 2 houses damaged, and 10 telephone poles blown down 2 miles north of causeway.

See footnotes with current data

NWRC, Asheville, N.C. --- 3/12/54 --- 2000



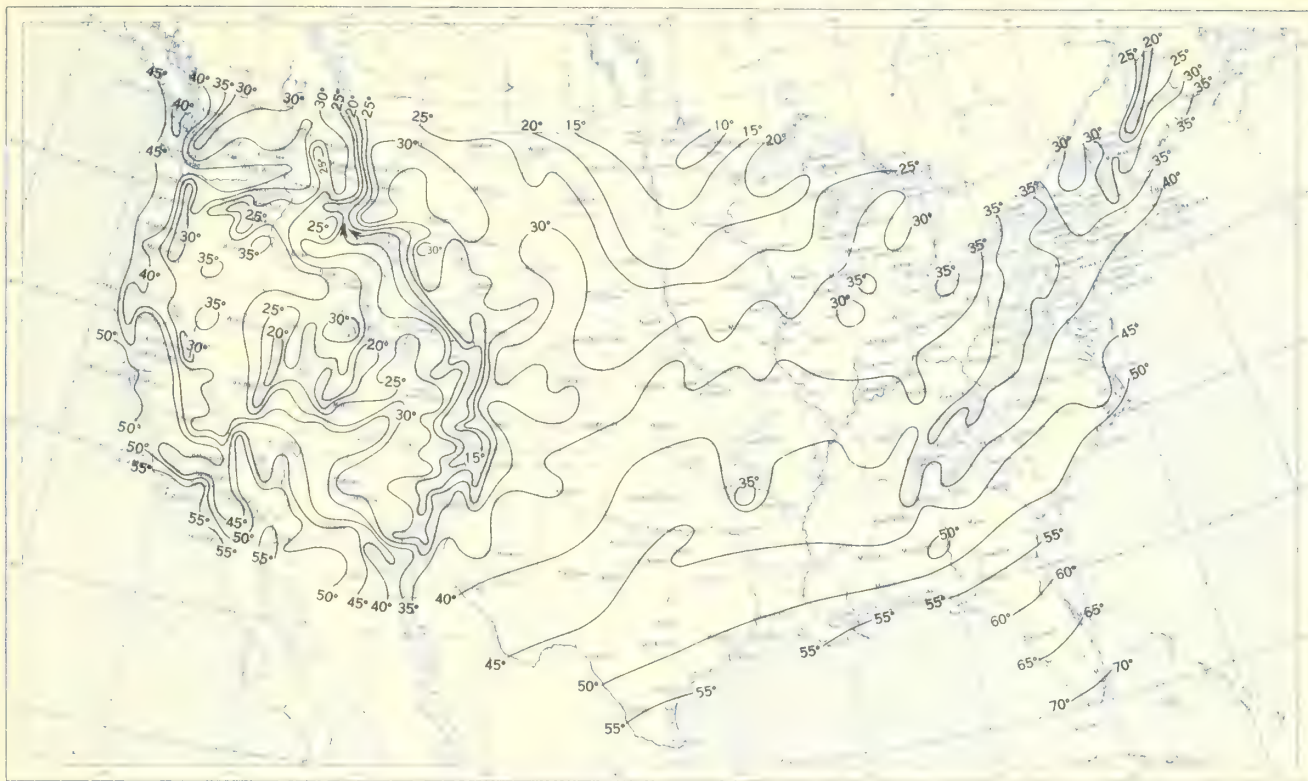




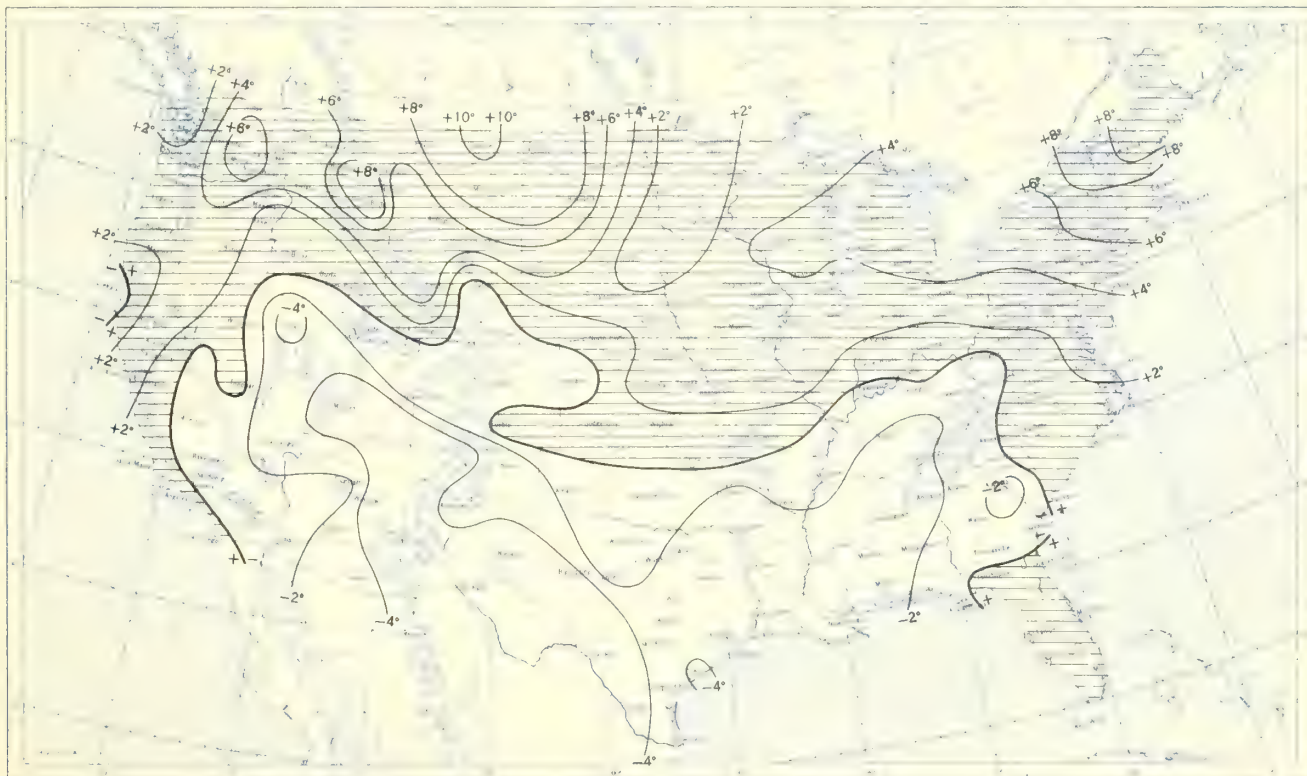




Chart I. A. Average Temperature ( $^{\circ}\text{F.}$ ) at Surface, December 1953.



B. Departure of Average Temperature from Normal ( $^{\circ}\text{F.}$ ), December 1953.

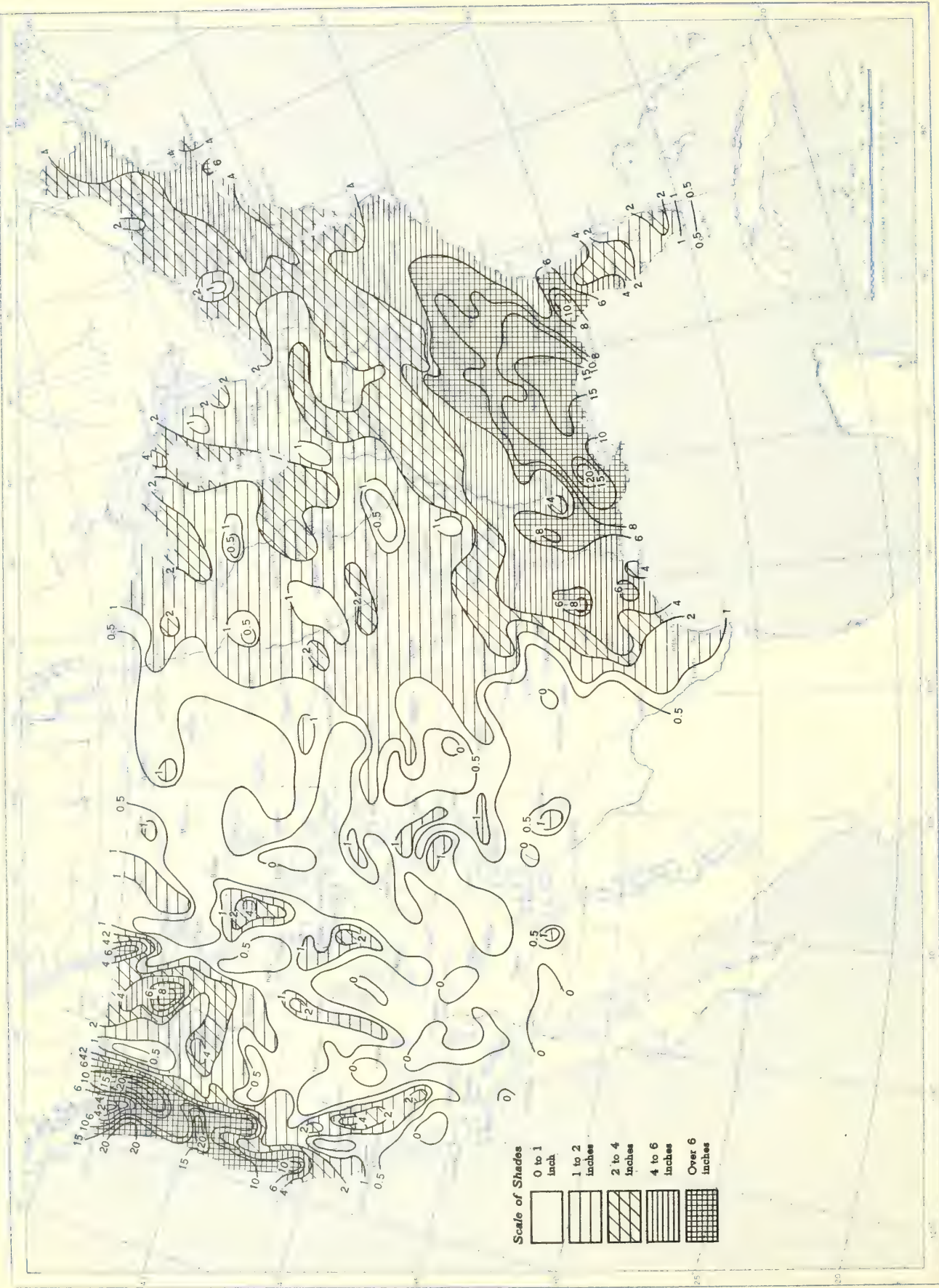


A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.



Chart II. Total Precipitation (Inches), December 1953.

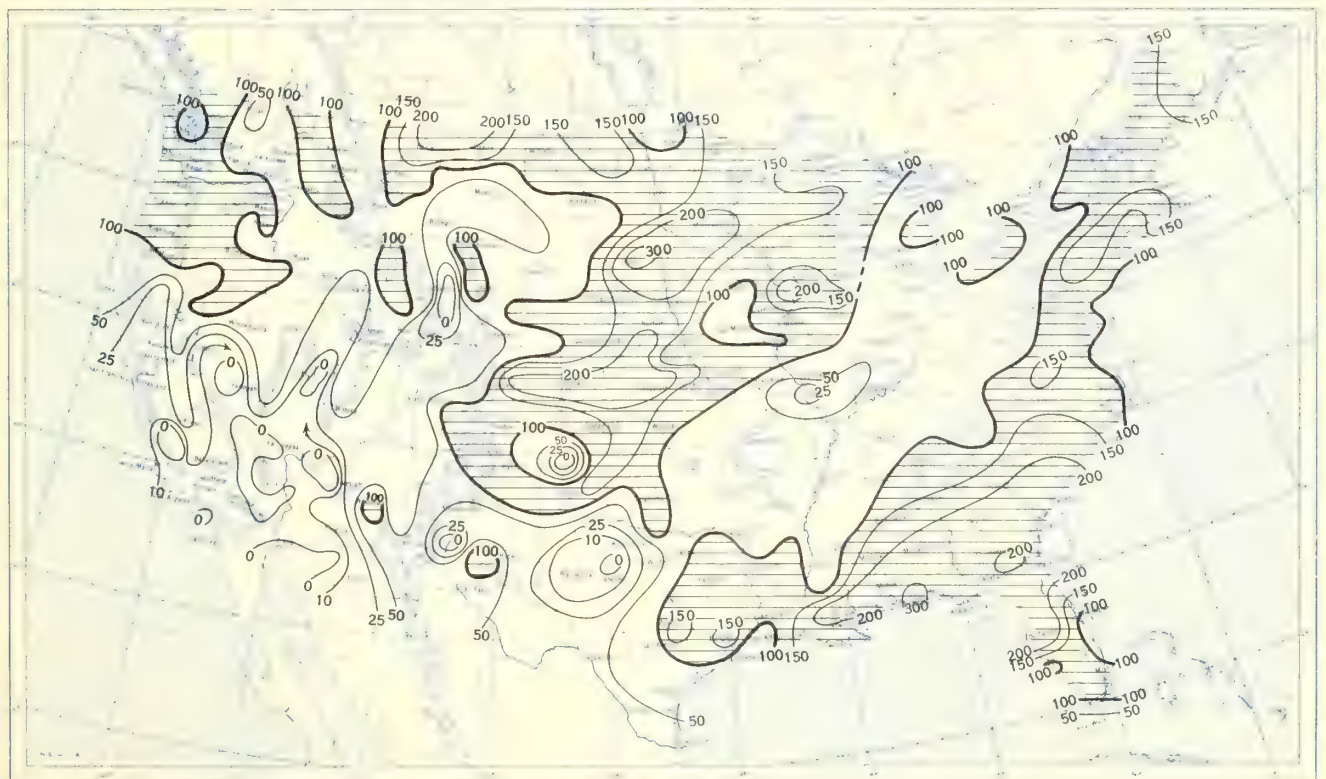


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), December 1953.



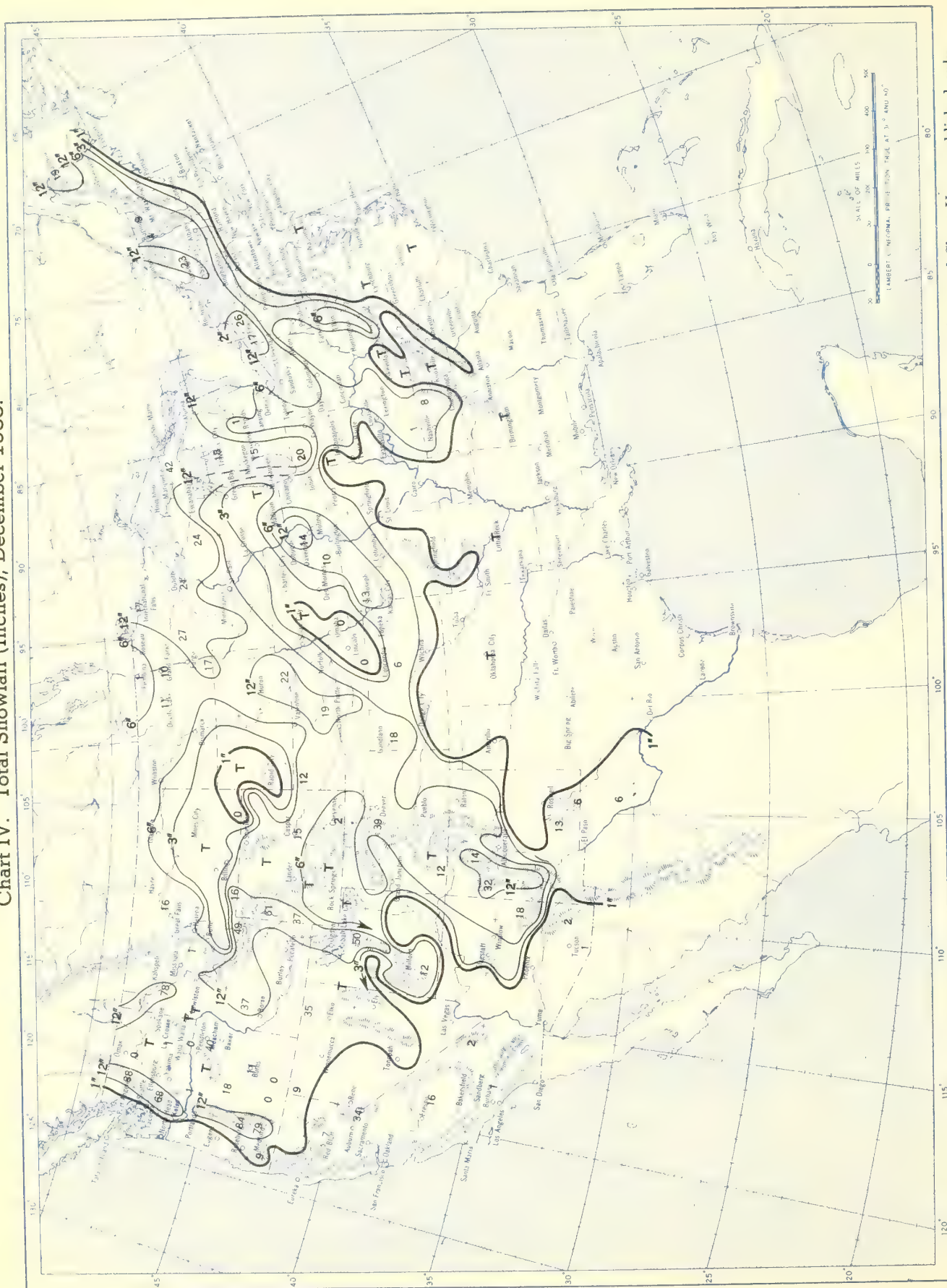
B. Percentage of Normal Precipitation, December 1953.



Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

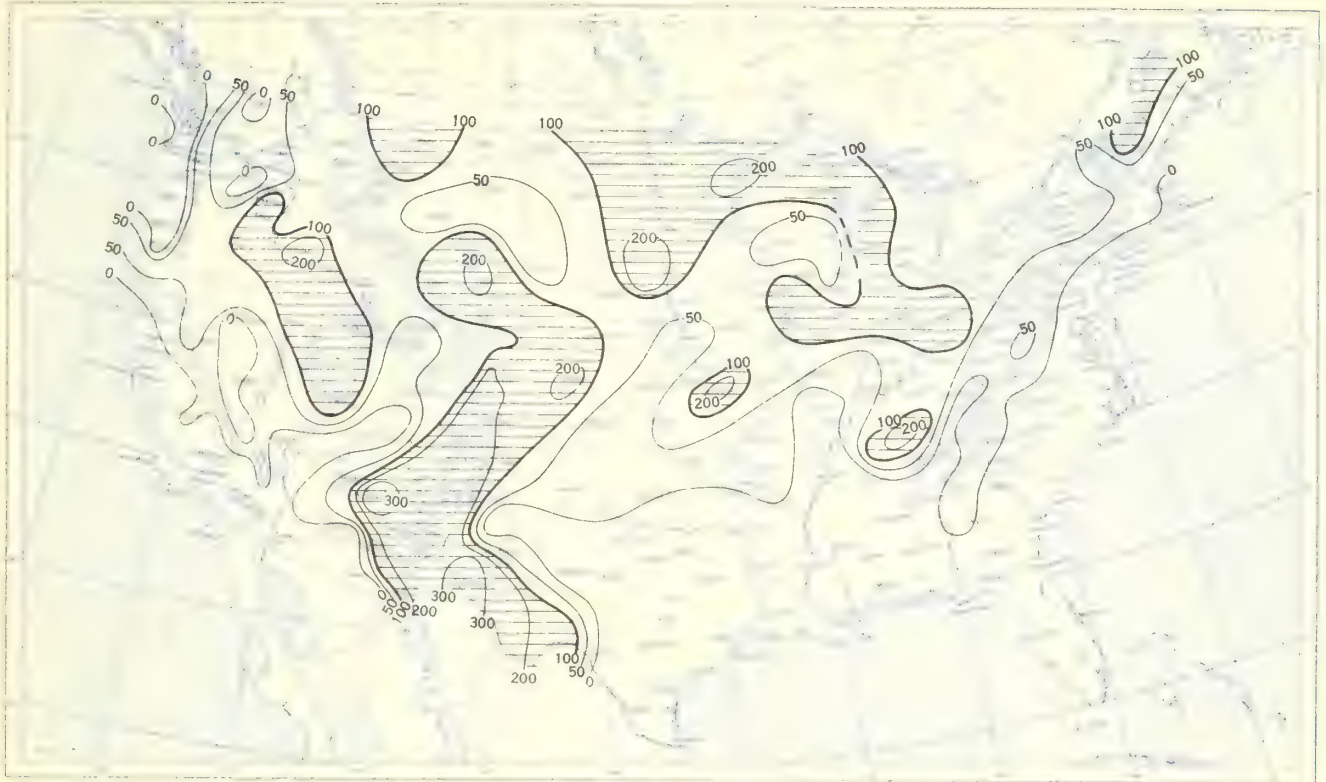


Chart IV. Total Snowfall (Inches), December 1953.



This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, December 1953.



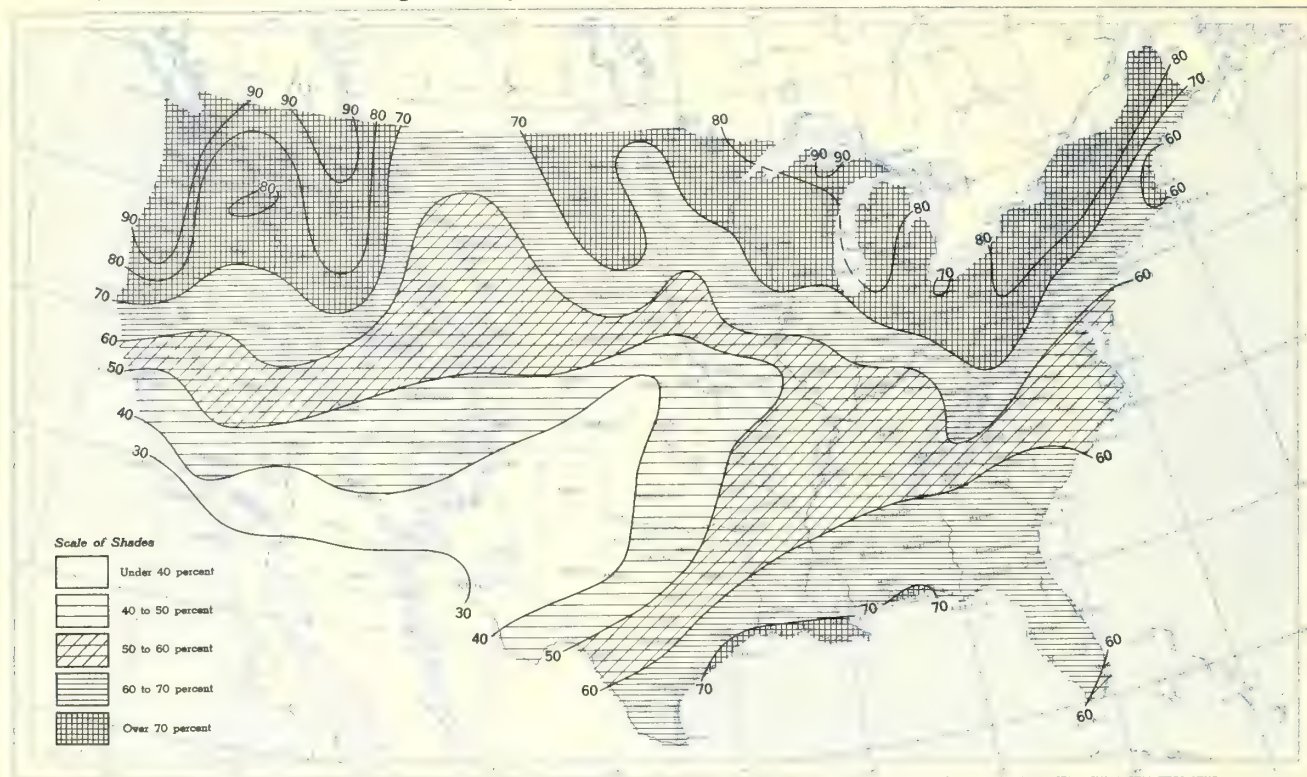
B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T., December 29, 1953.



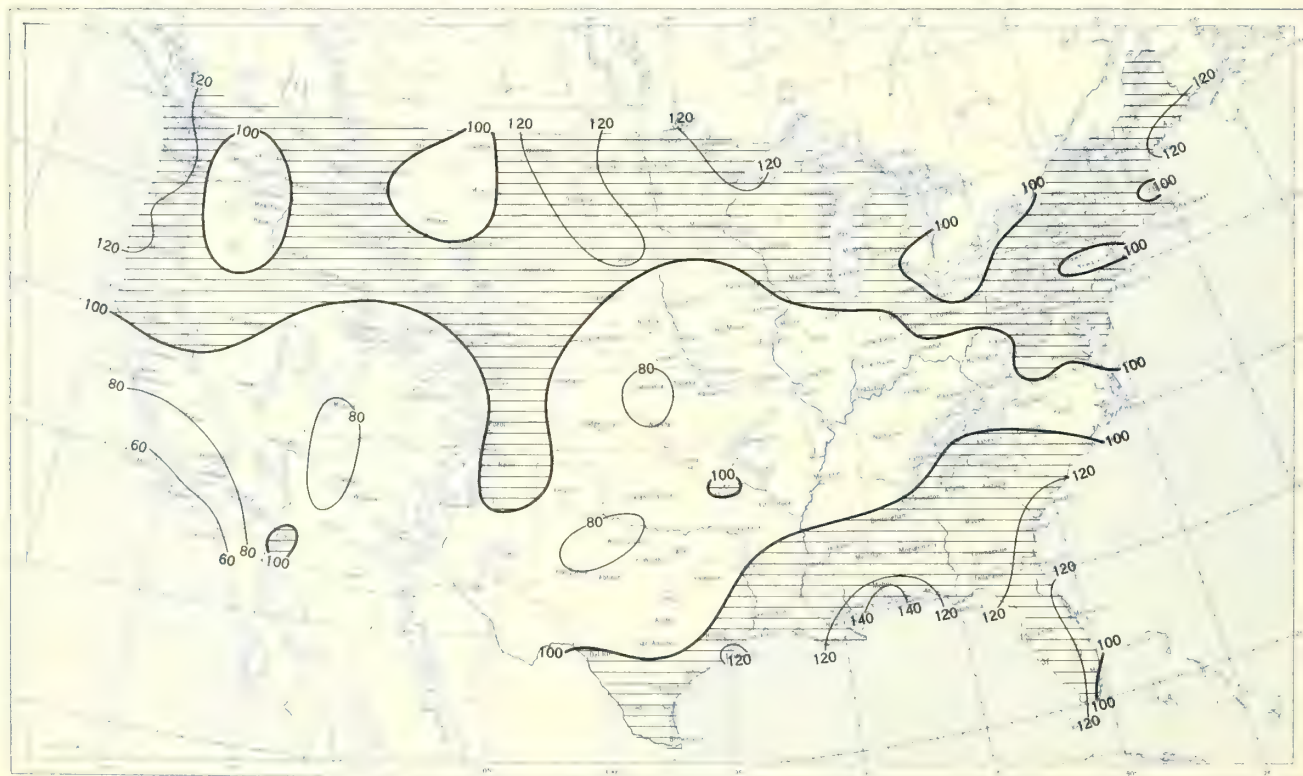
A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.  
 B. Shows depth currently on ground at 7:30 a. m. E. S. T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.



Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, December 1953.

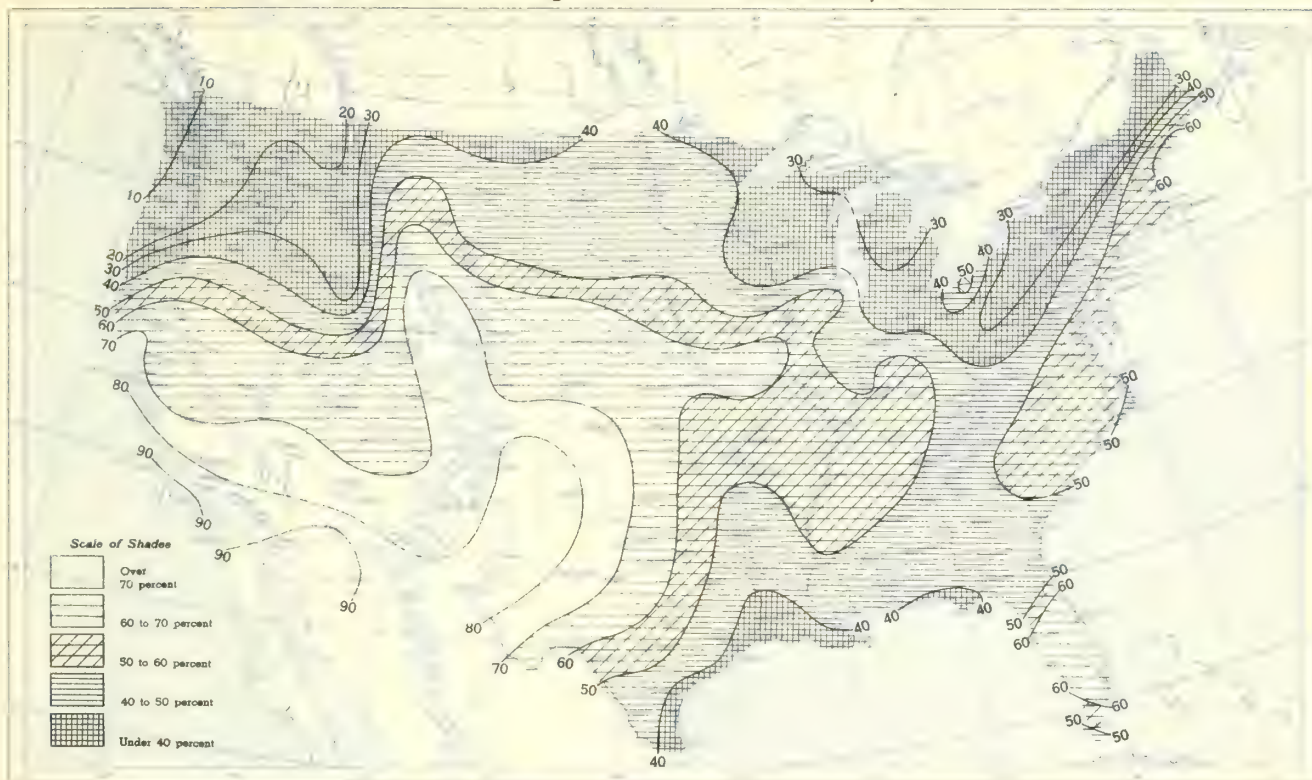


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, December 1953.

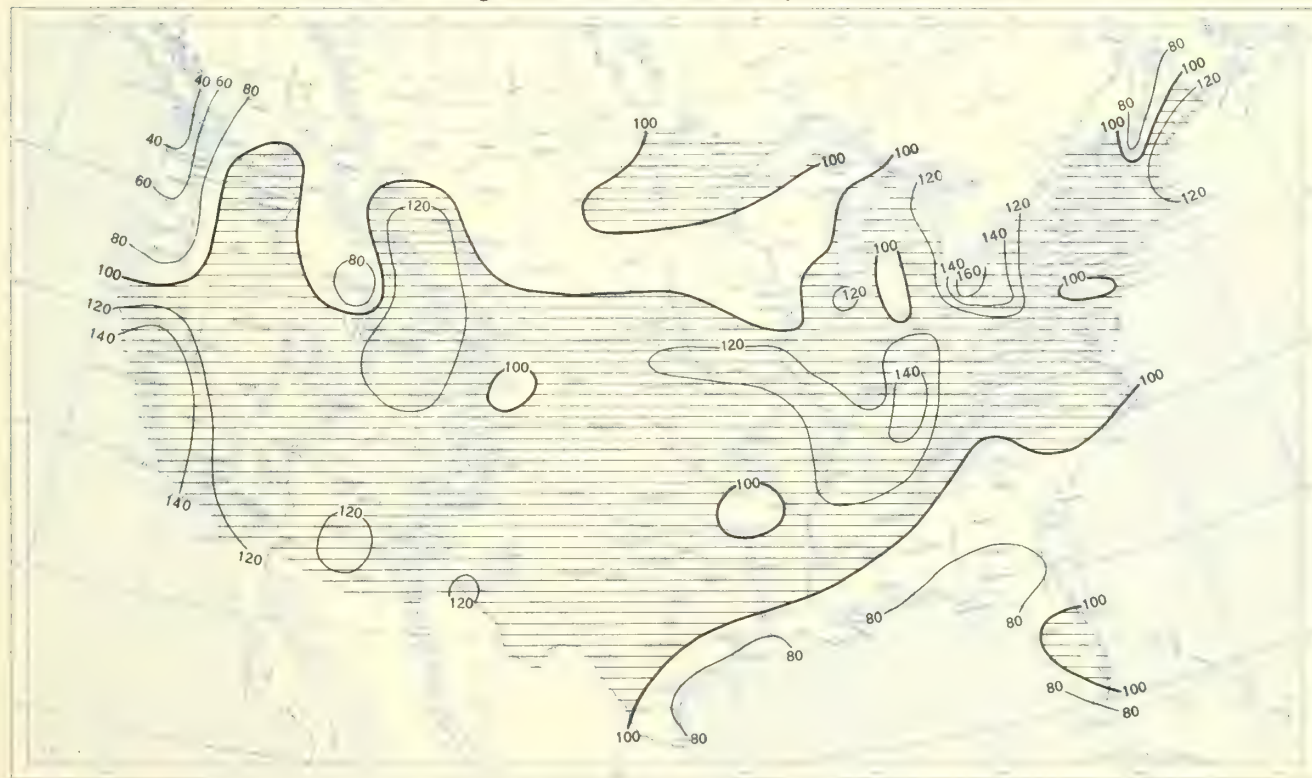


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, December 1953.



B. Percentage of Normal Sunshine, December 1953.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.



Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, December 1953. Inset: Percentage of Normal Average Daily Solar Radiation, December 1953.

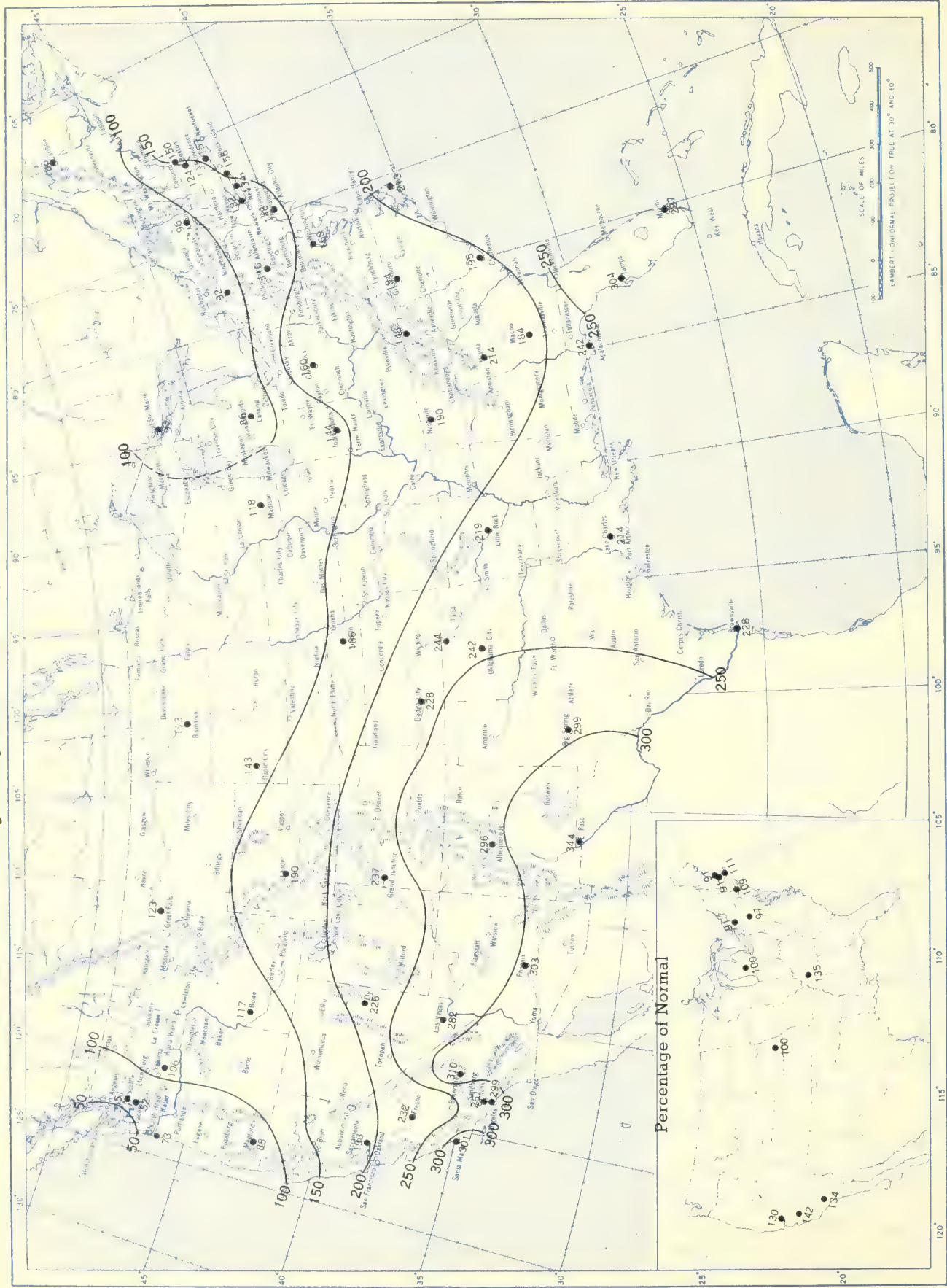
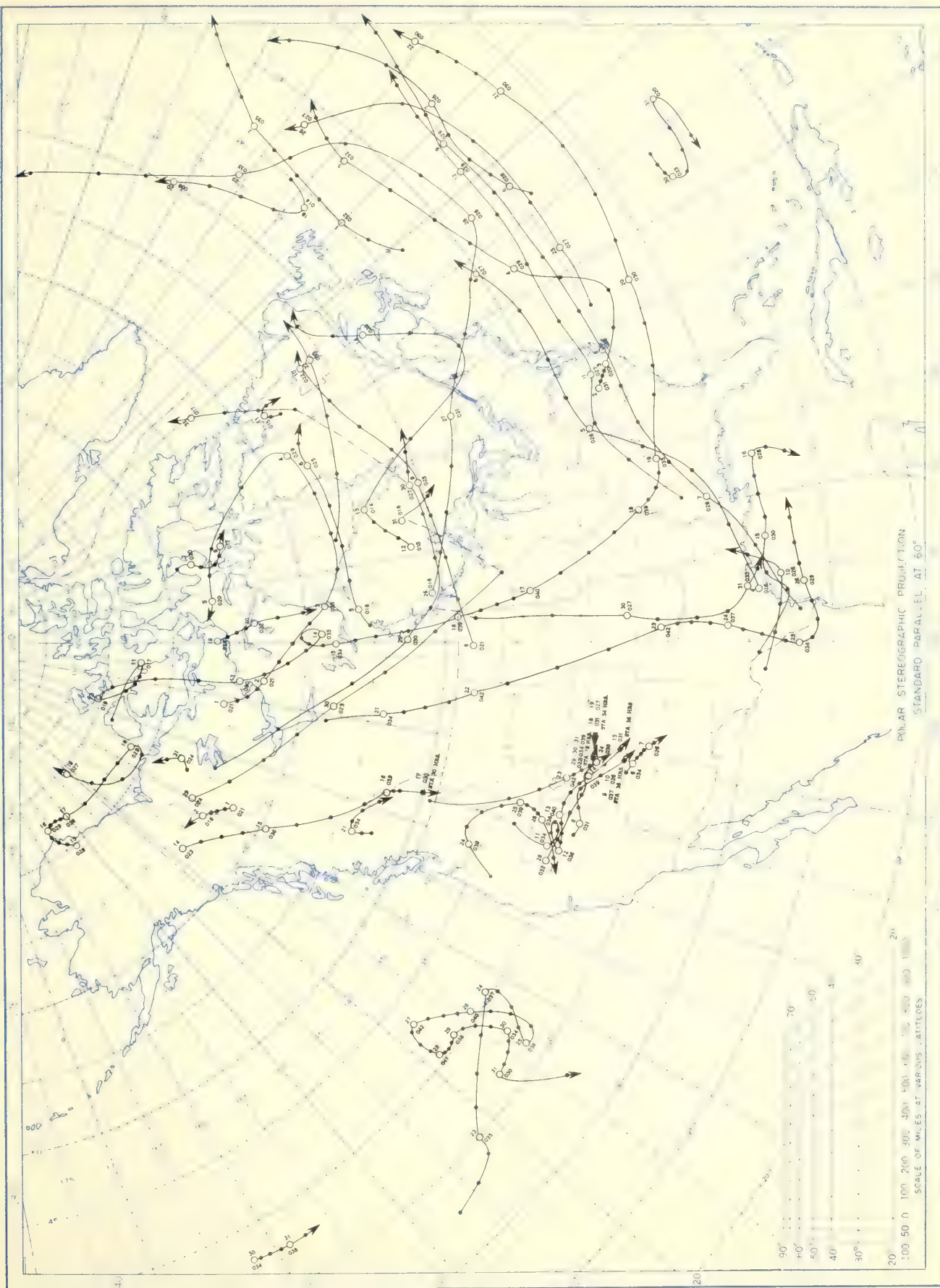


Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.<sup>-2</sup>). Basic data for isotherms are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals

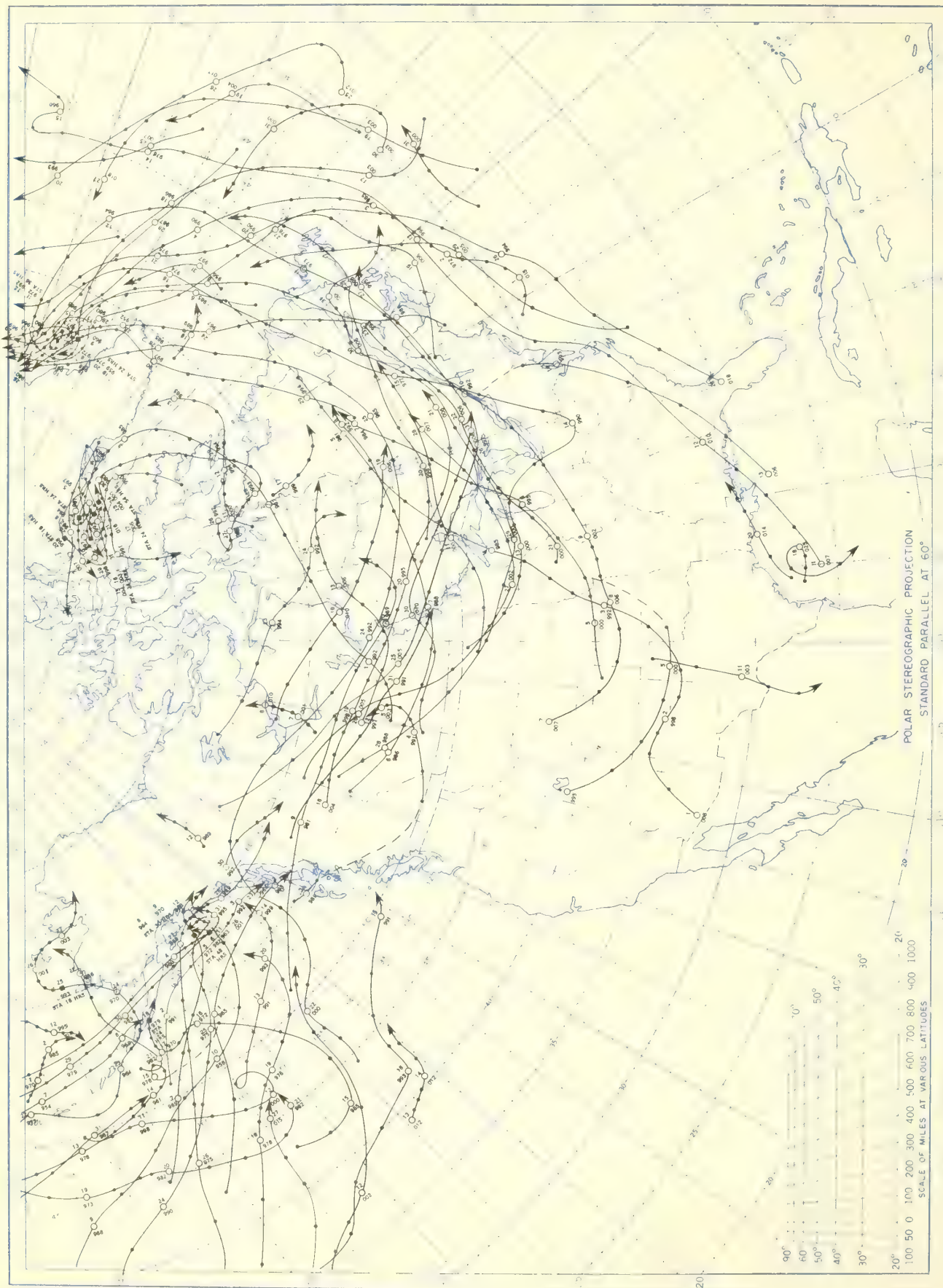
Chart IX. Tracks of Centers of Anticyclones at Sea Level, December 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar.  
Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

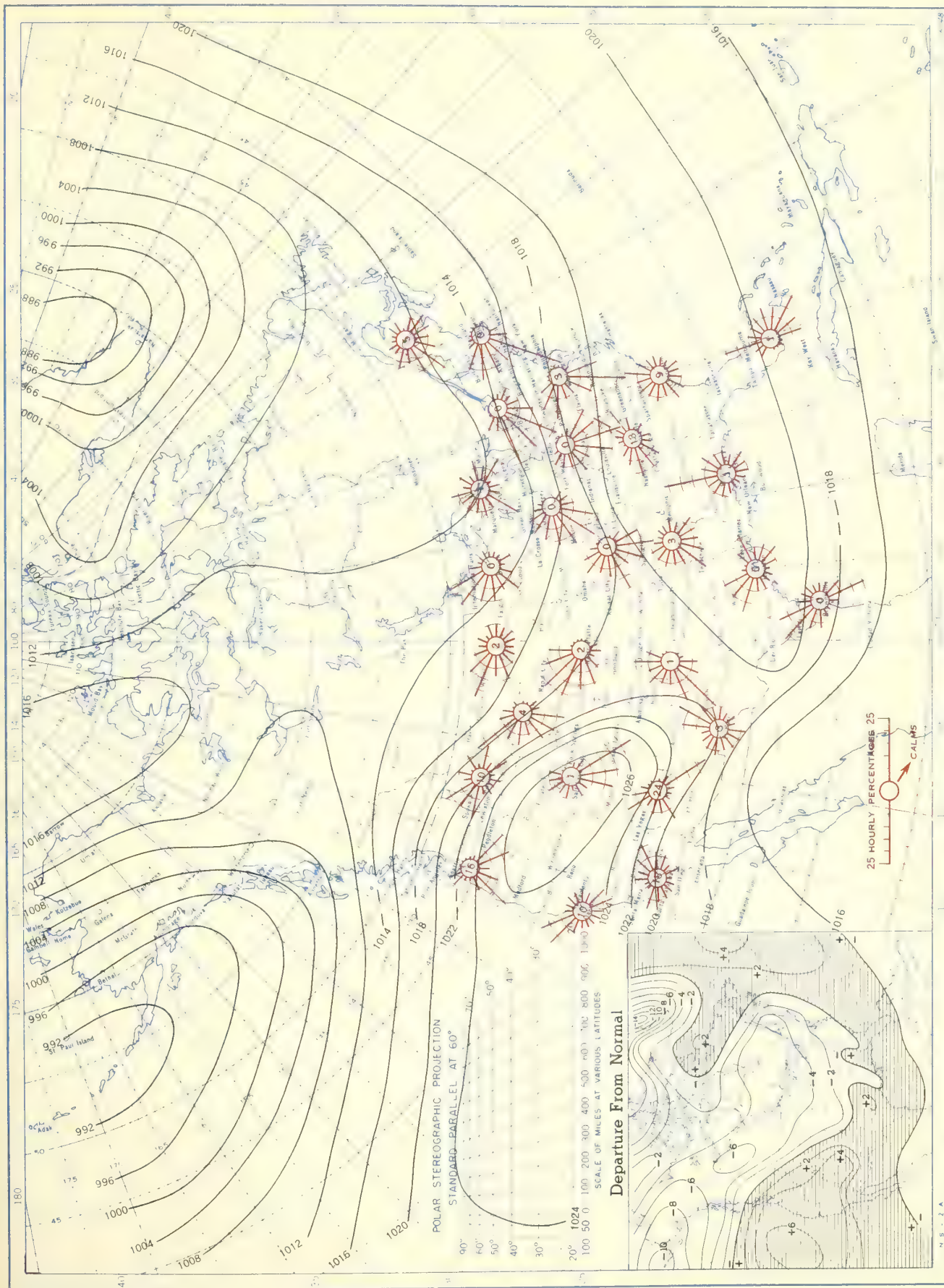


Chart X. Tracks of Centers of Cyclones at Sea Level, December 1953.



Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

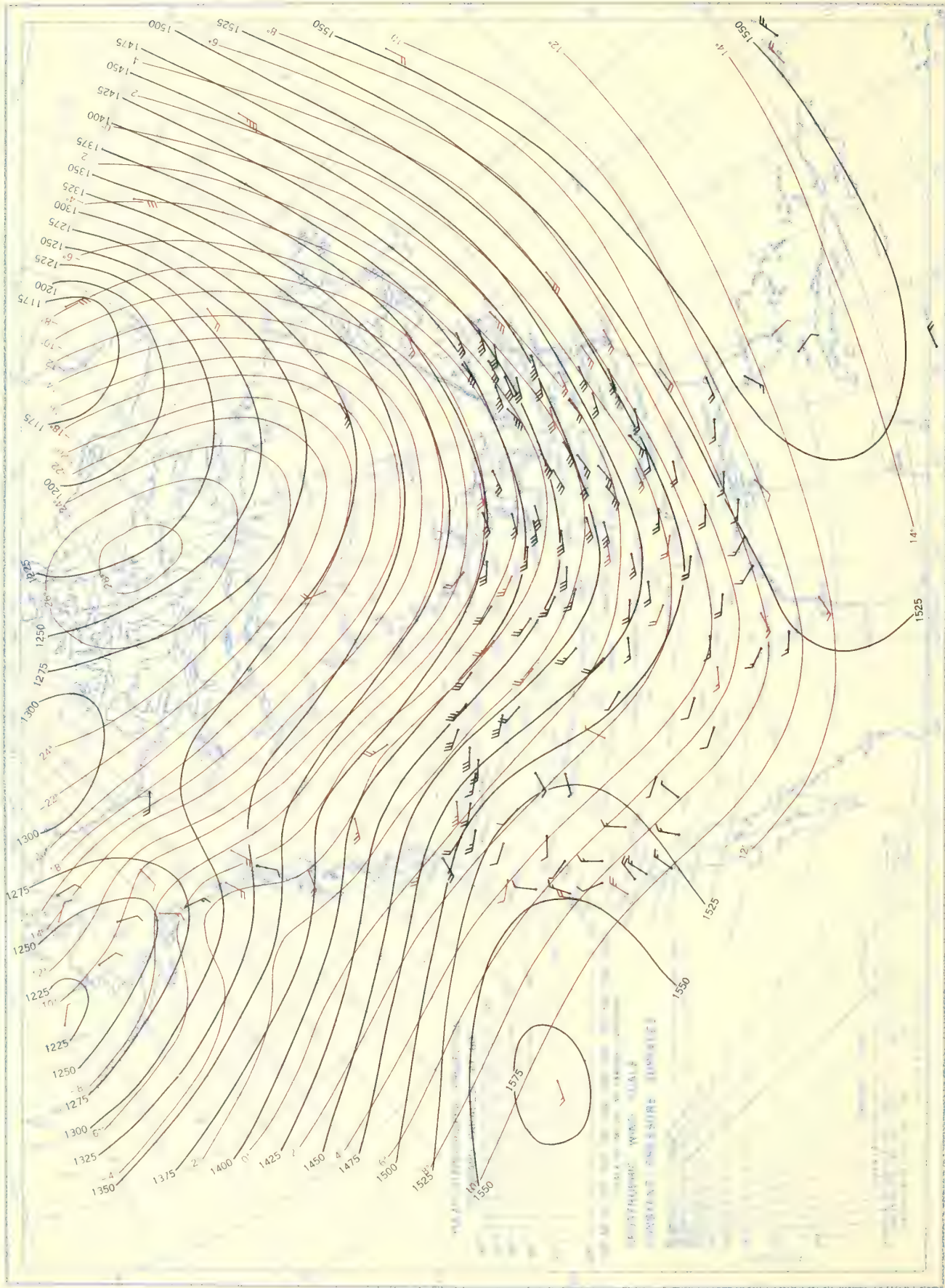
# Average Pressure (mb.) from Normal, December 1953.



Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Wind roses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° inter-sections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.



Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), December 1953.

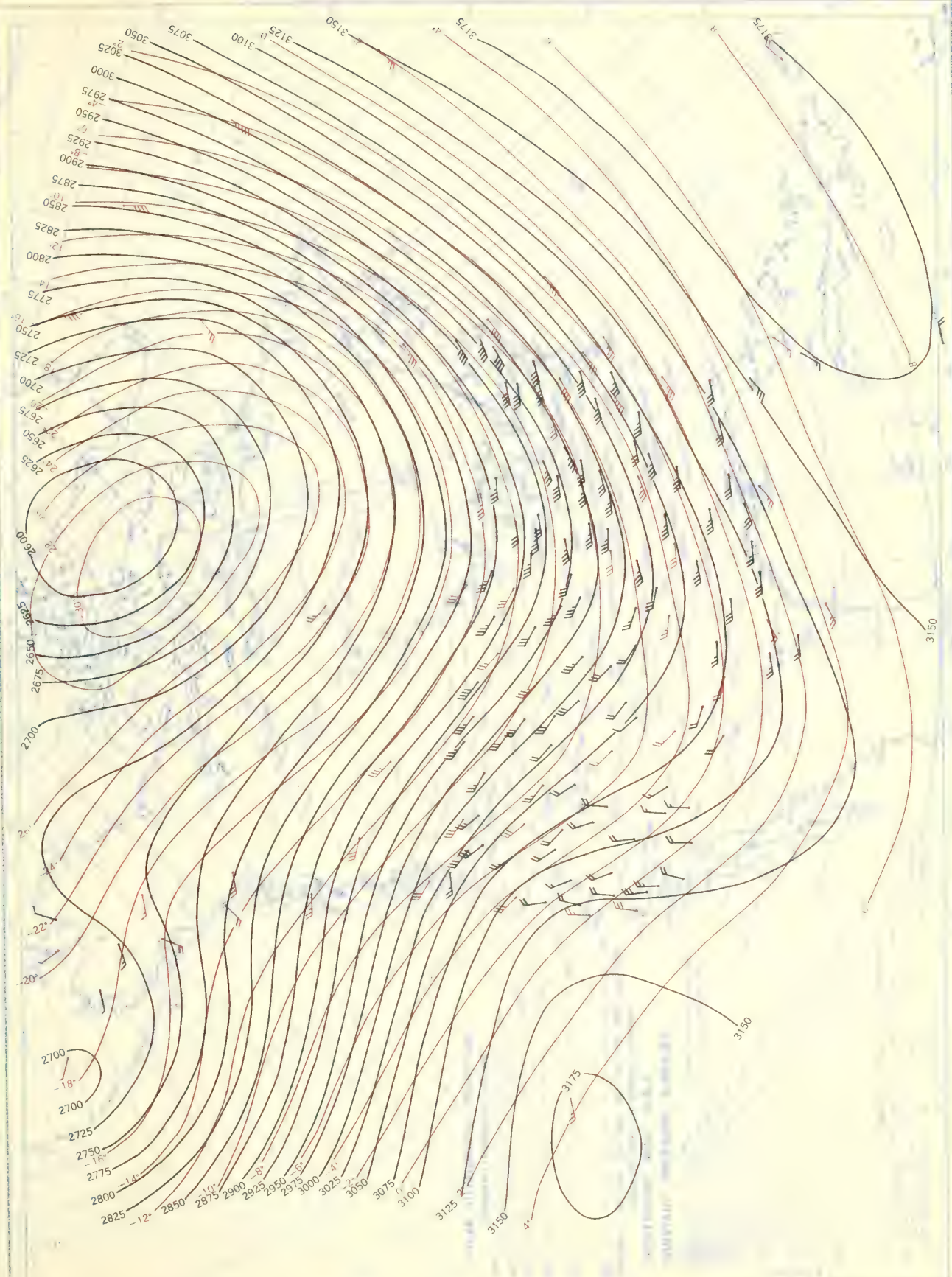


Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T. ; those shown in red are based on rawins taken at 0300 G. M. T.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. those shown in red are based on rawins taken at 0300 G. M. T.

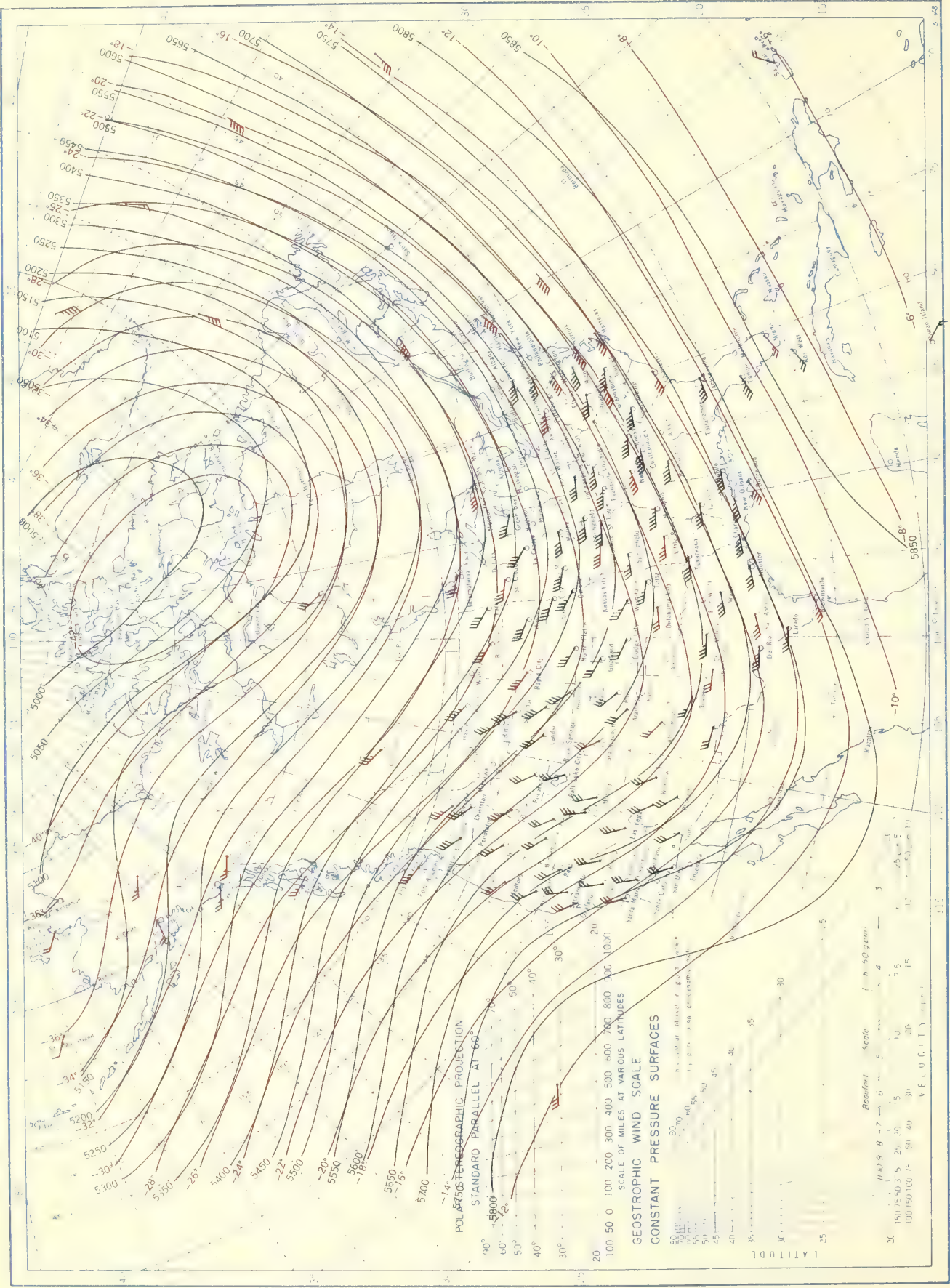
Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), December 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.



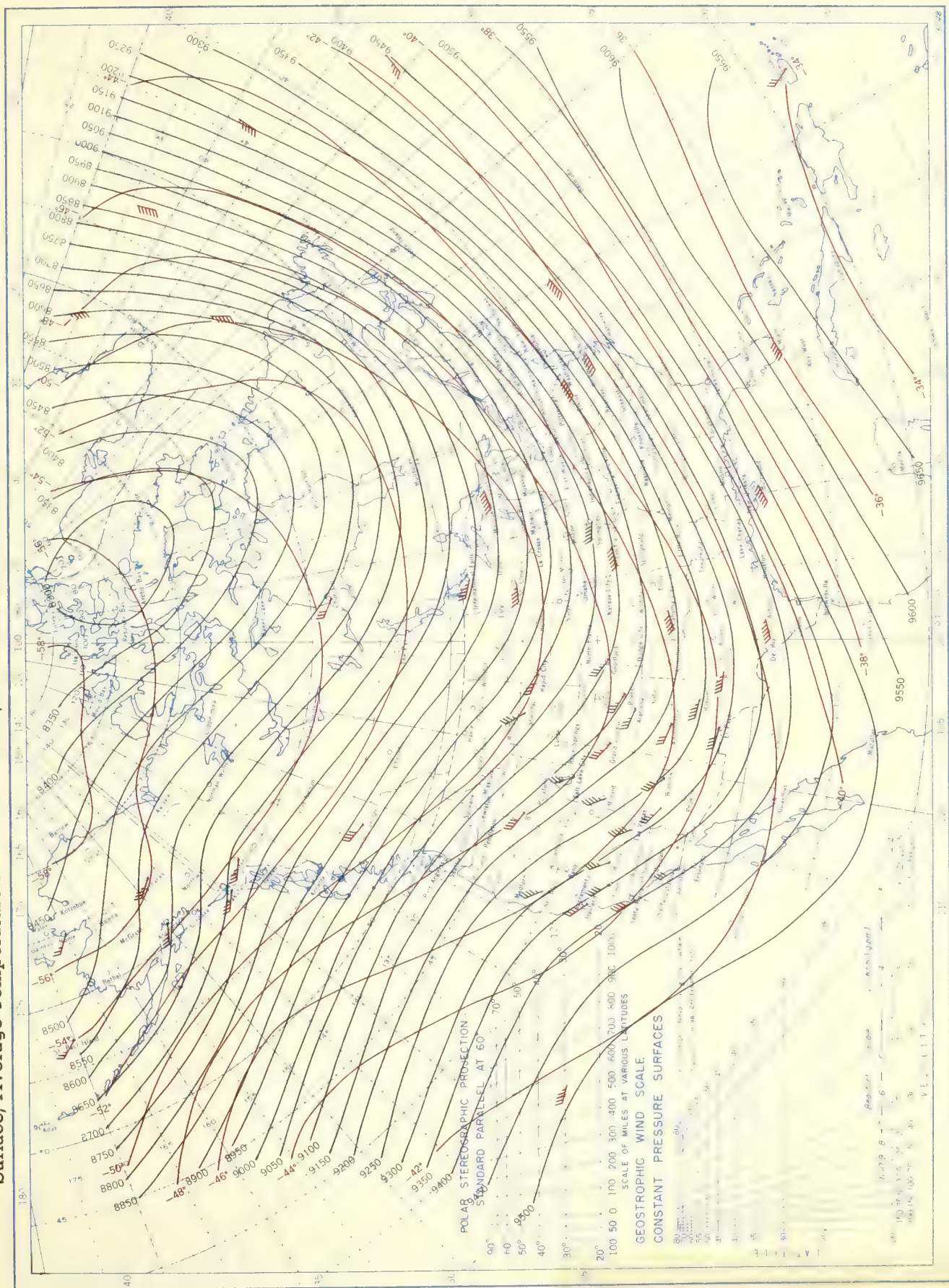
Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), December 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.



Chart No. 1. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.90 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), December 1953.



Contour lines and isotherms based on radiosonde observations at 0300 G.M.T. Winds shown in black are based on pilot balloon observations at 2100 G.M.T.; those shown in red are based on rawinsonde observations at 0300 G.M.T.



Clemson College Library  
Clemson  
South Carolina

CD

Penalty for private  
use to avoid pay-  
ment of postage  
\$300.

AGRICULTURAL REFERENCE DEPARTMENT  
CLEMSON COLLEGE LIBRARY  
U. S. DEPARTMENT OF COMMERCE

SINCLAIR WEEKS, Secretary

WEATHER BUREAU

F. W. REICHELDERFER, Chief

# CLIMATOLOGICAL DATA

NATIONAL SUMMARY

ANNUAL 1953

Volume 4 No. 13



ASHEVILLE: 1954



# CONTENTS

## SURFACE DATA

General Summary of Weather Conditions-----	1
Average Monthly and Annual Temperatures by States-----	5
Departures from Normal of Monthly and Annual Temperatures by States-----	5
Departures from Normal of Annual Temperatures for Past years by States-----	6
Average Precipitation by States-----	6
Percentage of Normal Monthly and Annual Precipitation by States-----	7
Percentage of Normal Annual Precipitation for Past Years by States-----	7
Excessive Precipitation (Short Duration Rainfall) by Stations-----	8
Sunshine, Amount, and Percent by Stations-----	19
Annual Climatological Data by Stations-----	22
Normals, Means, and Extremes by Stations-----	31

## STORM DATA

General Summary of Tornadoes in the United States-----	37
Percentages of Tornado Occurrence from Indicated Directions - Tornado Rose-----	39
Tornado Data-----	40
Tornado Summary-----	62
Number of Tornadoes, Tornado Days, and Resulting Losses by Years - 1916-1953-----	65
Hailstorm Losses-----	66
Hailstorm Losses for Past Years-----	68
Windstorm Losses-----	68
Windstorm Losses for Past Years-----	70
General Summary of North Atlantic Hurricanes and Tropical Disturbances-----	71
Hurricane Data for Selected Storms-----	74
North Atlantic Hurricanes and Tropical Disturbances-----	76
Ships Observations in the Vicinity of Tropical Storms-----	77
North Atlantic Hurricanes and Tropical Disturbances for Past Years-----	79

## FLOOD DATA

General Summary of Flood Losses for 1953-----	80
Estimated Flood Losses for 1953-----	81
Loss of Life and Property in the United States from Floods, by Districts and Years, 1902-1953-----	84
Loss of Life and Property in the United States from Floods, by Months and Years, 1924-1953-----	89
Distribution of Estimated Flood Losses in the United States by Major River Systems, 1924-1953 (Chart)-----	90
Losses in Individual Great Floods in the United States Since July 1902-----	91
General Summary of River and Flood Conditions for 1953-----	93

## UPPER AIR

Radiosonde Data-----	95
Pilot Balloon Data-----	98
Rawin Data-----	99

## SOLAR RADIATION DATA

Average Daily Values by Stations-----	100
Daily Totals and Average Daily Totals by Weeks of Direct and Diffuse Radiation at Stations Not Available for Publication in Monthly Issues-----	101

## CHARTS

I---Departure from Normal of Annual Average Temperature (°F) at Surface, 1953
II---Percentage of Normal Annual Precipitation, 1953
III---Tracks of Tornadoes, 1953
IV---Tracks of North Atlantic Hurricanes and Tropical Disturbances, 1953

## SUBSCRIPTION PRICE

Monthly and annual, 15 cents per copy; yearly subscription, including monthly and annual issues, \$1.50. Checks and money orders should be made payable to the "Superintendent of Documents." Remittance and correspondence regarding subscriptions should be sent to "Superintendent of Documents, Government Printing Office, Washington 25, D. C."

# CLIMATOLOGICAL DATA

## NATIONAL SUMMARY

Volume 4 No. 13

ANNUAL 1953

### GENERAL SUMMARY OF WEATHER CONDITIONS

**GENERAL.**--Severe drought was the most notable and costly weather feature of 1953. Beginning in the western part of the lower Great Plains during the spring months, it expanded over most of the Southern Interior by midsummer and over most of the remainder of the Country by early autumn. Losses to crops, pastures, and livestock plus added cost of replenishing water supplies amounted to hundreds of millions of dollars. Despite the drought, however, total crop production was above the average owing to several favorable factors, among which were plentiful subsoil moisture in most northern areas during the growing season, adequate irrigation water in the far West, abundant rainfall in the far Southeast, early crop maturity, ideal harvesting weather, and the absence of damaging fall frosts.

A second outstanding feature was the great damage done by a record number of tornadoes, the paths of several of them running through large cities and densely populated areas in the Northeast. Among the unfortunate cities struck by these destructive storms were Waco, Tex., Flint, Mich., Cleveland, Ohio, and Vicksburg, Miss.

The nationwide precipitation average was slightly more than an inch and a half below normal, even though monthly averages were above normal in January, March, April, May, and December. The yearly averages were much below normal in the Midwest, in most of the central and lower Great Plains, and in the far Southwest, but they were well above normal in Washington and Oregon and some adjacent areas, in the North-Central Interior, lower Mississippi Valley, east Gulf region, and along the Atlantic Coast except in parts of Virginia and North Carolina.

The 1953 temperature for the United States averaged nearly one and one-half degrees above the long-term mean, with below average departures only from a small section in southwestern Oregon southward through the central portion of California to Bakersfield and in the San Diego area, eastern Arizona, west-central New Mexico, and a few small scattered sections in the Southeast. Nationwide averages were above normal for all months except April, May, and December.

The first 3 months of the year were unseasonably mild with about normal precipitation. The ground remained unusually free of snow, and navigation began early in many northern lakes and streams, the most notable example occurring at Buffalo, N. Y., where Lake Ontario was virtually free of ice all winter and the beginning of navigation there on March 2 was the earliest during the past 100 years.

During April and the first half of May cold, wet weather retarded growth of vegetation, and widespread frosts and freezes caused light to locally severe fruit damage in the far West and some damage to fruits and other early crops in middle and southern areas east of the Rocky Mountains. Abnormally low temperatures persisted through most of the summer in the Pacific States, although dry sunny weather after June enabled crops to

make good recovery from the cold wet weather of spring. Heat and drought prevailed over large sections of the Country from June until late November when a return to near or above normal precipitation ended the drought in nearly all areas, although subsoil moisture and water supplies remained low in several sections from the east-central Great Plains eastward through the Ohio Valley and western Pennsylvania.

In the far West, where irrigation water supplies depend to a large extent upon the mountain snow pack, seasonal falls were above normal in northern areas but below normal in the central and south. The season's snowfall was the least in 20 years in Utah, only 80 percent of average in Colorado and for Nevada the least of record.

Strong winds were unusually persistent in the Southwest, particularly in Arizona, from late March through June. High winds were also frequent in the Great Plains during April, and in the central and lower portions of that region where the topsoil was dry and loose they caused occasional severe duststorms. Of particular intensity was the storm on April 30 when dust reached great heights and was carried eastward, obscuring the sky as far away as Evansville, Ind., and Cincinnati, Ohio.

**DROUGHT.**--The 1953 drought was notable for its complexity. After becoming intense in an area of significant size it would be broken, only to reappear later in the same area or to develop with similar intensity elsewhere. Drought first developed during the spring in the Southwest where scanty rainfall was a continuation of the dryness of the two previous years. A period of unusually hot, dry weather in the lower Mississippi Valley and east-central areas from May 19 to July 6 extended the drought coverage over practically the entire southern interior portion of the Country and it steadily increased in severity. For this 7-week period less than one-tenth of the normal rainfall was received in extreme southern, northern, and western Texas, some far southwestern districts, most of Oklahoma and Arkansas, extreme western Tennessee, and northwestern Mississippi. Pastures, small grains, corn, cotton, and other crops suffered severely in most of this region. Showers from June 27 to 29 brought limited relief to eastern Texas, Louisiana, and southern Mississippi; but it was not until after the first week of July that general showers over the southern Interior brought considerable relief to most of this area, and it was yet later (with the heavy rains the last part of August and the first week of September) that the prolonged drought in the Rio Grande Valley was effectively broken.

The July and August rains generally missed the area from southeastern Nebraska and eastern Kansas eastward to Maryland, Virginia, and the Carolinas, resulting in a gradual build-up of severe droughty conditions. The centers of severe dryness in this region were Missouri, the Ohio and middle Mississippi Valleys, West Virginia, and the central portions of Virginia and the Carolinas where



pastures and other crops, especially corn, were damaged considerably, an extremely high fire hazard was created, and subsoil moisture and water supplies were seriously reduced.

Another hot, dry period from early September to mid-October intensified and extended the drought over practically the entire Country, except the far Southeast, middle and northern Pacific coastal sections, and a few local areas. During this period about one-half the total area of the Country received less than 25 percent of normal rainfall and some sections less than 10 percent. This severely afflicted area included the Ohio and middle Mississippi Valleys, most of Missouri and Iowa, a narrow belt extending from southern Minnesota westward to northern Nevada, and extreme southern California and Arizona and southwestern New Mexico.

Widespread rains in late October alleviated the drought from Virginia northward through New England and brought limited relief to an area extending from northern Mississippi, Arkansas, and Missouri to Michigan, western portions of the northern Great Plains, and middle Rocky Mountain sections. Moderate to heavy precipitation from the eastern Great Plains to the Atlantic Coast during the third week of November and the first week of December replenished topsoil moisture and improved water supplies, but in many sections from the east-central Great Plains eastward through the Ohio Valley into western Pennsylvania subsoil moisture remained low and water hauling continued at the end of the year.

**PRECIPITATION.**--The year's precipitation was less than 15 percent of normal in the southwestern desert areas, less than 50 percent in all of southern California and parts of south-central and southwestern Texas, and less than 75 percent in a large midwestern area including western and southern portions of Ohio, southern portions of Indiana and Illinois, all of Missouri, southern Iowa, northern Arkansas, southern and eastern Kansas, and southeastern Nebraska.

Summer rainfall (June, July, August) was less than 25 percent of normal in parts of western Texas and southern Missouri, two of the worst drought sections, and less than one-half normal throughout northern and western Texas, northeastern New Mexico, most of Arkansas and Missouri, parts of the Ohio Valley, and in some sections of central Virginia and North Carolina. Streams in the central and lower Great Plains and from the central Mississippi Valley to the Atlantic Coast remained at unusually low levels all summer.

Dry weather continued during the autumn (September, October, November). Average precipitation was less than 50 percent of normal in the Rocky Mountain State area, the Ohio Valley and Tennessee, nearly all of the Mississippi Valley and parts of the Great Lakes region. For Kentucky the average rainfall of 5.10 inches for August through November was the least on record for that period, and at Louisville 36 rainless days, from September 20 to October 25 inclusive, set a new record for the station.

In Washington, Oregon, northern and western Idaho, and most of Montana the year's precipitation was well above normal and crop production generally was above average; in fact, production of several crops in Idaho was reported to be the greatest on record. The year's greatest total precipitation, 149.12 inches, was recorded at Valsetz, Ore. In Montana a total of 55.36 inches at Summit was the greatest annual total recorded

in the State since the turn of the century. In northwestern California and western Oregon, floods in January and October resulted in damage totaling several million dollars, and flooding during the first decade of July in the vicinity of Great Falls, Mont., caused losses estimated at \$5,000,000.

In the Dakotas, Minnesota, and Wisconsin, precipitation for the year was normal or above, and crop production was among the best of record. Floods in Minnesota, occurring mostly in June and October, caused over \$5,000,000 damage. In nearby Iowa, where production losses of corn and soybeans due to drought probably exceeded \$100,000,000, flood losses in June exceeded \$30,000,000, with the heaviest in the Sioux City area.

In Florida, Georgia, and the East Gulf States the year's precipitation also was well above normal and crop production was average or better. While brief periods of drought occurred in these States, they were either too late in the season or of too short duration to cause serious crop losses. For Florida, rainfall for the year averaged 68.66 inches, a yearly average for this State exceeded only by 72.70 inches in 1891. Heavy rains in April and May caused widespread flooding in these States and the lower Mississippi Valley. The flooding was most severe in Louisiana where the floods were responsible for 12 persons losing their lives and property and crop losses of about \$100,000,000. During October flooding in southern Florida caused losses of about \$9,000,000.

In New England, although the period June through September was very dry and drought occurred in large areas, the year's precipitation was above normal mainly because of a record total precipitation for the period January through May. March floods caused losses estimated at \$12,000,000. At Boston, Mass., 1953 was the wettest year since 1878 despite the drought that prevailed from June through September.

**TEMPERATURES.**--At scattered stations in the northern half of the nation temperatures for the year averaged 4° or more above normal. The most persistent above-normal departures occurred in the Northeast where all monthly averages for Maryland, Delaware, and New Jersey exceeded the normals. Yearly averages for New Jersey (54.6°) and New England (48.6°) were the highest on record. The year's most unusual heat wave occurred in the northeastern quarter of the Country during late August and early September. Nearly all stations in the area recorded their highest temperatures of the year during this period. At many stations, including Chicago and New York, the duration of extreme heat was the longest on record, and also at many stations temperatures reached record high levels for September. At Stroudsburg, Pa., 106° on September 3 set a new high September record for the State.

Another hot spell occurred in the Southeast in late May and early June. In South Carolina May was the warmest on record, and at scattered stations in this and surrounding States record high temperatures for May were recorded.

No unusual hot spells occurred in the far West, although the year's highest temperature of 123°F. was recorded in southern California's Death Valley -- at Cow Creek on July 23 and at Greenland Ranch on the 22d and 23d.

The most unusual temperature feature of the year was the extreme mildness in January which for the Nation as a whole was warmer than the

# GENERAL SUMMARY OF WEATHER CONDITIONS--Continued

YEAR 1953

average December or February and only a few degrees colder than the average November or March. The United States average temperature for January was a degree higher than the average for any other January since nationwide averages were first computed in 1893. January averages in the northern Rocky Mountain region ranged up to 16°.

No unusual cold snaps occurred, although frosts and freezes in April and May were later than usual in some central and far western sections. The year's minima in the Northeast in many cases were the highest minima on record. The lowest in the Country during 1953 was -45° at Thoeny, Mont., on January 15.

**SNOWFALL.**--Heavy snowfall during January and February was infrequent and of limited extent; consequently there were no serious interruptions of transportation. Unusually heavy snow, however, included a record 24-hour fall of 14.7 inches at Salt Lake City, Utah, on January 14, and record February totals of 33.9, 26.1, and 23.7 inches at Lander and Sheridan, Wyo., and Rapid City, S. Dak., respectively.

March snowfall was above average in the northern mountains of the far West and in a belt extending from southern portions of New York and New England and northern Pennsylvania to the Rocky Mountains, nearly all of which fell during the first decade.

April snowfall was heavier than usual in nearly all areas where snow in April is a common occurrence. From the 6th to the 9th unusually heavy falls of 30 to 40 inches occurred in southwestern Montana, several feet in some mountainous areas of northern Utah and 20 to 30 inches at some valley stations just north of Salt Lake City. On the 10th and 11th up to 15 inches fell in northwestern Kansas. East of the Great Plains most snow fell during the period 13th to 21st when several stations including St. Louis, Mo., Cincinnati, Ohio, and Boston, Mass., measured record depths for so late in the season.

Heavy snows fell in the northern mountains of the far West again during May, with 61.3 inches at Kings Hill, Mont., from the 24th through the 26th; and in the Great Plains up to 3 inches fell as far south as western Oklahoma on the 12th and 13th.

No further snows of any importance occurred until October when unseasonably heavy falls up to 6 inches were recorded in northern New York and New England on the 7th and 8th, 22 inches at Edgar, Mont., on the 21st and 22d, and a record October fall of 6.5 inches for Pocatello, Idaho, on the 21st. November snowfall was unusually heavy in the Ohio Valley and middle Atlantic States, the central Great Plains, and the central and lower Rocky Mountain region, but was generally much below normal elsewhere. In the middle Atlantic States most of the snow fell during a storm on the 6th and 7th when record early-season amounts included Harrisburg, Pa., with 15.4 inches, and Washington, D. C., with 6.5 inches. Deficient snowfall continued through December except in the lower Rocky Mountain region and at a few north-central sections.

**DESTRUCTIVE STORMS.**--The year 1953 was the severest on record for tornadoes. Damage caused by 7 of these storms ranged from \$15,000,000 to nearly \$53,000,000 each, and total tornado damage for the year was estimated at \$224,345,900, a new record.

Outstanding storms other than tornadoes included: two violent windstorms which caused \$9,180,000 damage in Wichita, Kans., on June 21; one of the most destructive hailstorms on record, which caused \$6,000,000 damage to standing wheat in the southwestern portion of the Nebraska Panhandle on July 2; \$4,250,000 hail damage in Iowa on July 5; and a general cyclonic windstorm that resulted in losses of more than \$10,000,000 along the north Atlantic Coast on November 6 and 7. Total wind damage for the year (not including tornado losses) was nearly \$152,000,000, and hail losses amounted to nearly \$50,000,000.

During 1953 the United States felt the effects of three hurricanes but only two entered the mainland. Crossing eastern North Carolina on August 13-14 and moving northward along the Atlantic Coast on the 14th and 15th before curving out into the Atlantic, hurricane "Barbara" caused heavy rains 50 to 100 miles inland from North Carolina to southern New England. Damage, amounting to over a million dollars, was limited mostly to crops and nearly all occurred in North Carolina, but losses were more than offset by benefits of the much needed rains. Wind gusts up to 90 m.p.h. were reported from Hatteras, N. C., and winds up to 61 m.p.h. from Atlantic City, N. J.

The next two hurricanes occurred in September. "Carol", moving northward over the Atlantic on the 6th and 7th brushed the New England Coast where gale-force winds and heavy seas caused marine losses (mostly to fishing craft) and some property damage on shore that altogether was estimated at slightly more than a million dollars. "Florence", moving up from the Gulf of Mexico, entered northwestern Florida on the 26th and with diminishing intensity curved northeastward across southeastern Alabama and southern Georgia during the next 24 hours. Winds and rains caused losses (mostly to crops) of \$100,000 to \$200,000 in Florida, over \$3,000,000 in Alabama, and some damage of undetermined extent in Georgia.

The worst winter-type storm of snow, glaze, and sleet, occurred in the Northeast from January 7 to 11 when severe glaze caused losses estimated at more than \$4,000,000.

Other storms included a \$250,000 snowstorm in New England on April 13 and 14, and glaze that resulted in \$450,000 damage in southeastern Missouri on April 18.

**DROUGHT IN HAWAII.**--During 1953 the Territory of Hawaii suffered from one of its worst droughts. The drought began developing in 1952, a relatively dry year, and steadily increased in intensity during the first 10 months of 1953, except for temporary relief in February, March, and May. With unusually dry weather from June through October, deterioration of ranges and dwindling water supplies reached a critical stage in September. Cattle were transferred from the driest areas of Malokai and Maui, sometimes to other islands, truck crops were hard hit and new plantings were curtailed. November and December rains alleviated the drought, but complete relief depended upon continued rainfall in January 1954.

Monthly and annual percentages of normal precipitation for the six principal islands and the Territory are indicated in the following table. Percentages for November and December are in parenthesis to indicate that the data are incomplete, but they are believed to be representative.



# GENERAL SUMMARY OF WEATHER CONDITIONS—Continued

YEAR 1953

ISLANDS	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Kauai	60	93	90	43	56	73	56	56	42	43	(61)	(68)	62
Oahu	35	94	111	41	71	61	63	54	36	40	(44)	(72)	60
Molokai	24	35	50	32	89	33	32	36	18	24	(58)	(61)	41
Lanai	30	28	62	26	104	18	19	9	1	19	(16)	(115)	37
Maui	11	48	70	24	106	70	50	59	26	50	(45)	(72)	53
Hawaii	5	97	109	41	130	75	64	65	38	51	(69)	(72)	68
Territory	22	82	96	37	96	70	59	60	36	47	(53)	(74)	61

These percentages are misleading insofar as they indicate Island-wide rains, as leeward areas received much less rain during the drier periods.

For the Territory the average rainfall for the year, 47.50 inches or 61 percent of normal, was the least for any year during the past 49.

This low average has been closely approached only in the years 1919 and 1926 with averages of 48.03 and 50.45 inches, respectively. On November 10 President Eisenhower declared the drought sections in the Islands disaster areas and eligible for Federal assistance.

# AVERAGE TEMPERATURE

Table 1

YEAR 1953

Section	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	50.2	49.8	58.9	61.2	74.3	80.9	80.0	79.5	74.3	66.2	52.9	45.3	64.5
Arizona	46.0	43.8	51.2	56.6	60.3	75.7	80.7	78.0	74.0	61.7	52.1	40.0	60.0
Arkansas	45.2	45.8	56.2	57.7	70.1	83.4	80.2	79.6	74.7	64.8	49.5	41.1	62.4
California	49.0	48.0	50.8	55.3	57.5	66.1	77.0	72.7	72.0	61.0	53.4	46.4	59.1
Colorado	31.7	27.7	38.1	41.0	49.9	65.4	69.5	65.9	60.7	49.4	37.9	25.0	46.9
Connecticut	32.1	33.8	38.6	48.1	59.2	67.4	71.4	69.4	64.0	54.0	43.7	36.3	51.5
Delaware	39.6	39.6	44.9	53.4	66.5	72.0	76.7	74.2	68.8	58.5	46.6	40.6	56.8
Florida	60.3	63.1	68.9	70.3	75.5	80.7	81.8	81.3	79.2	72.0	65.1	62.0	72.0
Georgia	50.9	51.3	59.2	62.4	75.6	79.5	80.0	79.6	73.9	66.1	54.1	48.1	65.1
Idaho	35.3	31.5	37.3	42.6	48.6	57.1	69.2	66.7	60.6	49.4	40.0	27.6	47.2
Illinois	32.0	36.1	42.7	49.3	64.0	77.1	77.4	75.5	68.8	59.5	44.6	33.4	55.0
Indiana	33.4	35.8	42.4	48.2	64.2	75.3	75.6	74.3	67.4	58.2	43.9	33.3	54.4
Iowa	22.5	27.7	36.7	43.9	60.0	73.2	74.6	73.2	64.8	58.1	41.4	28.5	50.4
Kansas	36.7	39.5	47.5	51.2	63.4	81.1	78.8	77.3	72.2	60.8	44.6	34.3	57.3
Kentucky	41.3	41.4	48.8	53.6	68.7	77.1	77.2	76.0	69.8	60.2	45.5	36.8	58.0
Louisiana	54.4	53.2	65.0	65.9	75.7	83.4	81.4	81.2	77.3	69.0	56.5	49.4	67.7
Maine	23.8	23.9	31.4	43.6	54.0	62.9	67.4	65.1	58.6	48.5	40.4	30.5	45.8
Maryland	39.3	40.2	45.1	47.3	67.3	72.0	76.8	74.0	67.4	58.2	46.1	39.4	56.7
Massachusetts	31.8	32.7	37.7	47.2	58.0	66.9	70.2	68.5	63.4	53.4	44.8	36.7	50.9
Michigan	25.0	25.5	33.1	40.7	55.3	65.9	69.5	69.1	60.1	53.0	40.8	29.1	47.3
Minnesota	12.8	15.3	28.2	38.8	54.6	66.0	68.9	70.0	58.4	53.6	35.8	16.9	43.3
Mississippi	50.9	50.4	60.7	62.3	74.1	83.3	80.9	79.9	75.2	66.6	53.7	45.4	65.3
Missouri	35.2	40.1	47.2	51.6	65.5	80.4	79.2	77.7	71.9	61.1	46.5	36.4	57.7
Montana	28.6	27.8	33.9	37.7	48.5	50.8	67.9	66.6	58.1	49.9	38.1	28.4	45.4
Nebraska	30.2	31.1	41.3	44.4	57.8	74.0	76.1	74.5	66.5	56.9	40.3	29.4	51.9
Nevada	39.9	36.5	42.4	47.9	50.6	62.8	75.0	70.2	66.3	52.0	44.0	32.3	51.7
New Hampshire	25.5	25.9	33.4	43.9	56.1	64.8	68.8	65.0	59.5	49.5	40.6	31.2	47.0
New Jersey	36.1	37.3	42.4	51.0	62.9	70.3	74.7	72.4	67.2	56.8	45.4	38.3	54.6
New Mexico	40.6	36.5	46.9	52.0	57.5	73.1	75.0	71.9	66.9	55.2	44.5	31.3	54.3
New York	28.4	28.5	35.3	44.1	57.5	66.0	70.0	67.3	61.1	51.4	41.7	32.7	48.7
North Carolina	46.4	46.5	51.9	59.1	72.4	74.9	78.1	76.4	70.4	62.1	50.0	43.5	60.9
North Dakota	14.2	18.7	26.2	36.3	51.8	63.0	68.1	69.6	57.6	51.9	35.4	20.4	42.8
Ohio	34.7	35.3	42.0	47.5	64.0	72.6	74.4	72.8	65.8	56.6	43.6	34.1	53.6
Oklahoma	43.8	45.2	55.4	57.4	69.1	85.3	80.7	79.7	76.0	64.4	50.1	40.7	62.3
Oregon	41.0	40.0	46.4	45.0	50.1	65.1	68.8	64.6	61.7	55.1	44.2	31.8	49.5
Pennsylvania	33.6	34.0	39.8	47.5	62.2	68.9	72.5	70.4	63.8	54.4	42.6	35.0	52.1
Rhode Island	34.6	35.0	39.3	47.8	57.5	66.7	70.0	69.2	64.3	54.1	46.1	38.7	51.9
South Carolina	49.3	49.8	55.9	61.9	75.6	78.3	80.3	79.0	73.3	65.1	53.1	46.8	64.0
South Dakota	23.4	23.6	33.3	39.6	54.2	68.0	71.9	72.2	62.3	55.1	38.8	25.3	47.3
Tennessee	44.5	43.9	52.1	55.9	70.2	79.0	77.8	77.1	70.8	61.6	47.4	39.1	60.0
Texas	52.4	50.4	62.6	64.6	73.0	85.1	83.6	82.0	76.7	67.5	54.6	45.2	66.5
Utah	34.1	31.8	40.5	45.1	50.8	64.9	73.7	69.6	64.0	50.6	41.5	26.4	49.4
Vermont	23.8	24.6	32.5	43.3	56.5	64.5	68.6	64.8	58.4	48.7	40.4	30.9	46.3
Virginia	41.2	42.0	47.0	55.0	69.2	77.1	75.0	68.3	59.5	46.9	39.7	27.8	57.8
Washington	40.0	38.4	42.1	46.8	53.3	56.8	65.9	65.4	60.3	51.4	42.6	37.3	50.0
West Virginia	37.9	37.6	43.8	50.5	66.1	71.5	73.7	72.0	65.0	56.3	42.2	35.4	54.3
Wisconsin	19.9	19.3	30.7	40.3	55.7	67.1	69.5	69.6	60.0	54.0	38.5	23.7	45.7
Wyoming	30.7	24.3	34.2	36.7	46.3	60.9	69.2	65.8	58.4	47.7	36.7	23.6	44.5
Alaska	-7.0	4.9	7.6	28.5	41.2	53.4	55.9	51.4	43.0	25.5	11.6	4.1	26.7
Hawaii	68.5	69.1	68.5	70.0	71.4	72.4	73.7	74.3	74.1	73.2	71.0	68.8	71.3
Puerto Rico	72.9	73.0	73.8	75.9	77.3	78.3	79.0	79.2	78.9	78.0	76.9	75.2	76.5

# DEPARTURES FROM NORMAL TEMPERATURE

Table 2

YEAR 1953

Section	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	+3.3	+0.8	+3.0	-2.3	+2.8	+2.4	-0.3	-0.2	-1.2	+1.3	-1.3	-2.4	+0.5
Arizona	+5.3	-1.2	+8	-1.3	-5.5	+1.3	+5	-3	+1.3	-1	+2.3	-2.9	0
Arkansas	+4.0	+2.1	+3.8	-3.9	+1.0	+6.3	-3	-4	+6	+1.9	-1.7	-1.7	+1.0
California	+5.3	+9	-6	-1.7	-5.6	-3.5	+1.3	-1.8	+2.3	0	+1.4	+8	-1
Colorado	+8.4	+4	+3.7	-2.9	-2.7	+3.9	+2.1	0	+2.1	+1.9	+3.0	-1.0	+1.6
Connecticut	+5.0	+6.9	+2.8	+1.7	+1.7	+1.3	+1.3	+3	+1.4	+1.9	+2.7	+6.1	+2.8
Delaware	+4.5	+5.0	+1.3	+7	+3.3	+4	+6	-2	+3	+1.0	-1	+3.6	+1.7
Florida	+1.1	+2.5	+3.5	+4	+3.8	+7	+5	-1	-2	-9	+1	+2.0	+1.1
Georgia	+2.6	+1.5	+2.2	-1.6	+3.4	+8	-3	-2	+1.8	+7	-1.1	-3	+5
Idaho	+11.8	+3.5	+1.6	-2.6	-4.6	-3.2	+8	+1	+3.3	+2.0	+4.7	+1.3	+1.6
Illinois	+4.3	+6.2	+1.7	-3.2	+1.3	+5.0	+1.0	+9	+1.1	+3.6	+2.4	+2.2	+2.2
Indiana	+4.7	+5.2	+1.9	-3.0	+2.2	+4.1	+2	+6	+1	+3.0	+1.7	+1.6	+1.9
Iowa	+2.8	+5.1	+1.0	-5.0	-4	+3.7	-3	+6	+4	+5.6	+4.0	+4.1	+1.0
Kansas	+6.4	+5.3	+3.4	-3.3	-4	+7.3	-8	-1.0	+2.2	+3.1	+8	+1.4	+2.1
Kentucky	+5.2	+4.0	+2.3	-2.5	+3.3	+3.1	+2	+2	-4	+1.7	-8	-1.0	+1.2
Louisiana	+3.3	-4	+5.1	-1.0	+2.3	+3.4	-7	+2	-6	+9	-1.8	-2.5	+7
Maine	+6.6	+5.6	+2.3	+2.7	+1.5	+1.3	+2	-1	+8	+6	+5.2	+8.3	+2.9
Maryland	+5.7	+6.5	+2.3	+1.3	+4.4	+1.1	+1.6	+6	+3	+1.8	+8	+4.1	+2.6
Massachusetts	+5.2	+6.2	+2.5	+1.8	+1.5	+1.6	-4	-2	+1.2	+1.6	+3.8	+6.5	+2.6
Michigan	+4.9	+5.4	+3.5	-1.8	+1.4	+2.0	+5	+2.0	+1	+4.2	+4.8	+4.4	+2.6
Minnesota	+4.0	+3.0	+2.3	-3.5	-3	+1.6	-9	+2.8	-1	+7.6	+6.4	+1.6	+2.0
Mississippi	+3.3	+7	+3.7	-2.2	+2.2	+4.3	-2	-9	-6	+1.1	-1.3	-2.9	+6
Missouri	+4.4	+6.4	+2.7	-2.2	+9	+7.1	+1.5	+1.2	+2.6	+3.4	+1.9	+2.5	+2.7
Montana	+10.1	+6.8	+3.1	-5.7	-4.4	-1.7	-5	+6	+2.1	+4.4	+6.2	+5.4	+2.2
Nebraska	+7.0	+4.5	+4.9	-4.9	-1.5	+4.7	+7	+1.2	+2.2	+4.9	+3.1	+2.3	+2.4
Nevada	+9.2	+1.4	+9	-1.3	-6.4	-2.4	+1.5	-1.3	+3.4	+2	+3.4	-4	+7
New Hampshire	+6.2	+6.2	+4.3	+1.9	+2.1	+1.7	+7	-6	+1.1	+1.9	+5.1	+7.9	+3.2
New Jersey	+5.0	+6.3	+2.9	+1.1	+2.3	+1.1	+7	+3	+1.3	+1.9	+1.4	+4.5	+2.4
New Mexico	+7.1	-1.9	+2.7	-7	-3.5	+3.4	+1.5	-1	+1.3	0	+1.5	-4.4	+6
New York	+5.7	+6.3	+3.7	+2	+1.7	+1.3	+7	0	+3	+1.4	+4.1	+6.5	+2.7
North Carolina	+4.0	+3.1	+1.4	+5	+5.0	+1	+7	+1	-1.0	+1.4	-5	+5	+1.2
North Dakota	+7.3	+8.2	+1.5	-5.0	-2.1	-1	-1.5	+2.6	+5	+7.9	+8.0	+6.4	+2.8
Ohio	+5.5	+5.1	+2.9	-2.3	+3.4	+2.8	+7	+1.1	+2.2	+2.7	+4	+2.4	+2.2
Oklahoma	+5.8	+2.5	+4.6	-3.1	+9	+7.7	-1.6	+7	+1.6	+3	+2	+1	+1.5
Oregon	+9.3	+2.5	0	-2.5	-3.9	-4.7	-1.1	-1.0	+3.0	+4	+4.0	+2.5	+6
Pennsylvania	+5.0	+5.4	+2.1	-1.1	+2.6	+7	+3	+1	-2	+1.7	+1.2	+3.7	+1.8
Rhode Island	+4.8	+5.9	+2.7	+2.0	+1.6	+2.0	-4	-1	+1.0	+7	+2.9	+5.6	+2.3
South Carolina	+3.0	+1.9	+1.0	-5	+4.5	+4	+4	+1	-1.3	+9	-7	+1	+8
South Dakota	+6.3	+4.3	+2.0	-6.4	-2.2	+1.9	-1.2	+1.1	+7	+6.2	+5.7	+3.3	+1.8
Tennessee	+5.1	+2.5	+2.6	-2.8	+3.2	+4.1	0	+3	-5	+1.7	-1.0	-1.7	+1.2
Texas	+5.4	-1	+5.0	-3	+5	+5.5	+1.2	-2	+4	+7	-1.1	-2.8	+1.2
Utah	+9.3	+1.7	+2.3	-1.9	-4.9	+4	+1.8	-3	+3.2	+1.2	+4.4	-7	+1.4
Vermont	+5.8	+6.4	+3.6	+1.7	+2.5	+1.3	+7	-6	+3	+1.6	+5.4	+7.7	+3.0
Virginia	+4.5	+4.6	+1.3	+4	+5.0	+1.1	+1.8	+1.0	-1	+2.0	+1	+1.8	+1.9
Washington	+9.2	+3.8	+6	-1.8	-2.0	-4.0	-8	-6	+1.4	+1.3	+2.7	+3.7	+1.1
West Virginia	+4.8	+3.9	+1.3	-1.4	+4.3	+1.6	+6	+2	-1.1	+1.5	-1.0	+8	+1.3
Wisconsin	+5.6	+2.7	+2.2	-2.6	+5	+2.3	-6	+2.2	-1	+6.2	+5.5	+3.6	+2.3
Wyoming	+12.2	+2.1	+4.3	-4.2	-3.7	+2.9	+2.8	+1.2	+3.2	+3.3	+5.4	+4.3	+2.5
Alaska	-7.7	+6	-3.3	+4.6	+2.9	+3.0	+1.0	0	+4	-2.8	-8	+1.8	0
Hawaii	+3	+4	-1	+2	+2	-5	-6	-3	-6	-5	-8	-7	-3
Puerto Rico	-1	+1	+3	+9	+5	+4	+6	+2	+4	-1	+8	+8	+4



# DEPARTURES FROM NORMAL ANNUAL TEMPERATURE

Table 3

(For past years)

Section	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953
Alabama	+0.9	+1.0	+2.0	+0.7	+1.0	+1.1	+0.5	+1.8	+1.2	-1.5	+0.8	-0.3	+0.5	+1.0	+1.2	+1.4	-0.2	+0.7	+1.2	+0.1	+0.6	+0.1	+0.5
Arizona	-2	-9	-4	+2.4	-5	+9	-4	-3	+1	+1.1	-1.5	-6	+9	-1.4	-5	+3	+3	-4	-9	+1.3	-2	-4	.0
Arkansas	+1.1	+6	+1.6	+1.4	.0	+6	-3	+2.2	+1.3	-2.1	+5	-4	+2	+3	-6	+1.2	-6	-1.0	-1	-1.2	-9	-2	+1.0
California	+4	-1.1	-1.4	+1.5	-1.2	+6	-8	-7	+2	-7	-4	-6	+4	-1.2	-5	-1.0	-1	-1.6	-1.3	+6	-2	-6	-1
Colorado	+1.0	-2	+1.6	+1.4	+3.9	+1.7	+7	+1.4	+1.3	+4	-6	+1.3	+6	+1.3	-2	+1.1	+2	-6	+2	+9	+1.4	+1.7	+2.6
Connecticut	+2.6	+1.6	+1.0	-2	-3	+2	+1.3	+1.5	+3	-2.3	+4	+4	+7	+2	+2	+8	-3	-2	+2.8	+1	+1.4	+1.7	+2.6
Delaware	+2.2	+1.6	+1.3	-3	-5	+1	+4	+1.3	+1.2	-2.3	+7	+4	+1	+1	+2	+1.1	-4	-2	+2.2	-4	+4	+6	+1.7
Florida	.0	+1.1	+1.2	+1	.0	+1	-1	+3	+7	-1.7	.0	-3	-3	+4	+1.0	+1.5	+5	+1.8	+1.7	+7	+6	+5	+1.1
Georgia	+1.0	+1.2	+1.7	+1	+4	+5	.0	+1.1	+1.0	-1.7	+5	-4	-1	+1	+6	+1.0	-8	+6	+1.2	-1	+3	+5	+5
Idaho	+3	-1.5	-5	+4.3	-6	+2	-8	+9	+1.4	+2.3	+1.0	-1.0	-1	-8	-3	.0	+6	-1.2	-8	-2	-1.1	-7	+1.6
Illinois	+3.5	+7	+2.3	+1.8	-1	+5	-8	+2.7	+1.9	-8	+2.0	+3	-4	+9	-7	+2.3	-2	+1	+1.2	-1.5	-1.5	+1.2	+2.2
Indiana	+2.9	+7	+2.1	+1.2	-1	+3	-7	+2.3	+1.7	-1.1	+1.7	+3	-4	+1	-5	+2.1	-7	+2	+1.4	-1.4	-1.2	+1.1	+1.9
Iowa	+5.0	.0	+2.6	+3.3	+4	+4	-7	+3.0	+2.9	-3	+2.9	+7	-3	+1	-5	+2.5	+7	+4	+6	-2.6	-3.0	+5	+1.8
Kansas	+2.4	-3	+2.8	+3.5	+9	+1.3	-4	+2.9	+2.8	-4	+1.2	.0	+4	+1	-4	+2.8	+2	-4	-4	-1.1	-2.2	+6	+2.1
Kentucky	+2.3	+1.0	+1.7	+9	+1	+7	-4	+1.9	+1.2	-1.9	+9	-1	-1	+7	.0	+1.5	-1.0	+1	+1.2	-1.0	-5	+9	+1.2
Louisiana	+2	+5	+2.2	+8	+8	.0	-1	+1.0	+1.0	-1.8	+2	-8	-2	+4	+4	+8	-6	+1	+7	+6	+6	-1	+7
Maine	+3.1	+2.2	+7	-2	+2	+5	+3.0	+2.2	-2	-6	+1.2	+1.3	+7	+1.0	+7	+1.1	+3	+3	+2.7	+8	+1.6	+1.6	+2.9
Maryland	+1.9	+1.0	.8	-2	-5	+2	.0	+1.3	+1.3	-1.8	+7	+3	+4	+6	+1.7	+2	+5	+2.7	+6	+1.0	+1.4	+2.6	+6
Massachusetts	+1.9	+1.1	+6	-4	-4	+1	+1.3	+1.4	+1	-1.7	+8	+4	-8	+3	+5	+1.2	+7	+1	+3.1	+4	+1.3	+1.6	+2.6
Michigan	+3.8	+9	+1.2	+2	-5	-7	+1	+1.8	+9	-1.0	+1.8	+4	-1.4	+1.0	-4	+7	+2	+4	+2.1	-1.4	-7	+1.5	+2.6
Minnesota	+5.2	-4	+6	+1.4	-5	-2.0	-1.3	+1.8	+1.9	-1	+2.5	+9	-9	+1.5	-1.0	+7	-1	+2	+5	-4.0	-2.6	+1.4	+2.0
Mississippi	+7	+5	+2.1	+9	+5	+3	+1	+1.6	+9	-2.3	+5	-5	+3	+6	+4	+9	-8	-1	+1.1	+1	+5	+1	+6
Missouri	+2.8	+4	+2.1	+2.2	-2	+1.1	-7	+3.2	+2.2	-1.2	+2.0	+3	-1	+7	-5	+2.6	+2	.0	+5	-6	-1.4	+1.2	+2.7
Montana	+2.5	-4	+1.0	+3.9	-5	-2	-1	+1.2	+2.3	+1.0	-2	-4	+2	-2	-2	+1.0	+3	-6	-1.0	-2.9	-5.7	+3	+2.2
Nebraska	+3.4	+3	+2.6	+3	+9	+4	-2	+4	+3.1	+6	+1.7	+6	+3	+1.0	-1	+3	+3	+3	-1.5	-2.3	+6	+9	+1.9
Nevada	+1.8	+1	+6	+4.6	+1.0	+2.4	+8	+9	+1.9	+2.7	+6	+1.0	+2.0	-1.0	+5	+1.3	+1.5	-6	-8	+7	-5.6	-8	+7
New Hampshire	+1.5	+6	-5	-1.4	-1.4	-8	+7	+1.0	-1.1	-1.9	+1	+6	-1.1	.0	+5	+9	+4	-7	+2.6	-6	+9	+1.7	+3.2
New Jersey	+2.4	+1.4	+9	-4	+4	+3	+1.0	+1.3	+1.0	-1.9	+1.0	+6	.0	+5	+6	+1.9	+5	+3	+3.1	+2	+1.2	+1.4	+2.4
New Mexico	-5	-1.0	+3	+2.4	.0	.0	-2	-1	.0	+2	-7	-1	+1.0	-9	+1	+9	.0	+4	-5	+1.8	-5	+2	+6
New York	+2.5	+1.3	+1.3	-4	-6	+2	+1.1	+1.6	+5	-1.8	+1.2	+8	-8	+4	+3	+1.6	+4	+2	+6	-3	+2	+1.0	+2.7
North Carolina	+1.0	+1.2	+1.8	.3	+1	+2	+1	+1.1	+1.2	-1.5	+6	+1	+1	.0	+7	+5	-6	+8	+2.2	+5	+5	+1.1	+1.2
North Dakota	+5.3	+4	+1.5	+3.8	-2	-8	-5	+2.3	+2.3	+1.4	+2.6	+1.3	+2	+1.4	-6	+1.2	+5	+4	+2	-4.3	-3.7	+1.4	+2.8
Ohio	+3.0	+1.4	+2.0	+1.0	+1	+4	-1	+2.4	+1.9	-1.2	+1.8	+7	-3	+9	-2	+1.9	-2	+5	+2.7	-7	.0	+1.5	+2.2
Oklahoma	+1.6	+1	+2.5	+2.5	+3	+1.3	-3	+2.3	+2.2	-1.1	+5	-3	+5	+4	-6	+2.0	-1	-9	-9	-9	-6	+8	+1.5
Oregon	+1.1	-2	-8	+3.1	-4	+5	-3	+5	+1.1	+1.8	+1.4	+2	-2	-2	-3	-1.0	+2	-1.7	-1.0	-6	-5	+4	+6
Pennsylvania	+2.6	+1.4	+1.5	+4	.0	+2	+5	+1.6	+1.5	-1.6	+1.1	+3	-7	-2	-5	+9	-6	-3	+2.0	-9	+1	+8	+1.8
Rhode Island	+2.5	+1.3	+7	-2	+1	+4	+1.8	+1.4	+3	-1.6	+6	+5	-4	+5	+2	+1.0	+3	-3	+3.0	+5	+2.0	+2.0	+2.3
South Carolina	+8	+1.5	+1.8	+2	+2	+3	-2	+1.1	+1.3	-1.6	+2	-2	-2	+1	+9	+1.0	+7	.0	+1.1	-2	+1.1	+1.1	+1.1
South Dakota	+4.5	-3	+2.5	+4.1	+9	-4	-9	+2.4	+3.0	+6	+2.4	+6	+4	-1	-6	+1.8	+2	+2	-1	-3.4	-3.5	+4	+1.8
Tennessee	+2.1	+1.5	+2.2	+1.1	+8	+9	+2	+2.0	+1.4	-1.6	+1.4	+2	+3	+8	+3	+1.7	-5	+1	+1.1	-6	.0	+7	+1.2
Texas	+1	-6	+2.1	+1.8	+3	-7	-4	+1.1	+8	-1.5	-5	-9	-3	-2	+1	+7	-8	-3	-1.3	-2	+1.0	+5	+1.2
Utah	+2	-1.5	-2	+4.2	+7	+1.1	-4	+6	+9	+2.2	-2	-7	+1.5	-1.3	-4	+7	+3	-8	-1	+6	-3	-3	+1.0
Vermont	+2.0	+1.2	+9	-6	-1.9	-1	+1.5	+1.4	-5	-1.3	+6	+1.0	-1.4	-1	+5	+8	+5	.0	+2.2	+1	+8	+2	+3.0
Virginia	+1.9	+1.6	+1.7	+3	-5	+1	-2	+1.1	+1.3	-1.6	+9	+5	+3	+1	+5	+1.1	-6	+1	+1.6	-2	+4	+9	+1.9
Washington	-4	-1.3	-1.6	+2.3	-6	.0	-7	+3	+9	+2.0	+2.1	+6	+3	+2	.0	+2	+5	+4	-2.5	-1.4	-2.0	-1.0	+1.1
West Virginia	+1.7	+1.0	+1.4	+5	.0	+3	-1	+1.5	+1.4	-1.6	+4	.0	-5	.0	.0	+1.4	-4	+1	+2.2	-3	+1	+8	+1.3
Wisconsin	+7	-1	+9	+1.2	-5	-1.3	-7	+1.8	+1.7	-8	-2.4	+5	-9	+1.7	-6	+1.9	+4	+8	+1.8	-2.3	-2.3	+1.5	+2.3
Wyoming	+1.3	-1.4	+1.3	+3.9	+3	+5	-5	+1.1	+1.6	+1.7	+1.1	-2	+1.6	-5	-2	+2.1	+8	+4	+7	-2	-1.3	+5	+2.5

## AVERAGE PRECIPITATION

Table 4

YEAR 1952

Section	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	5.55	7.35	3.65	7.74	4.22	4.03	6.00	2.43	4.84	0.57	2.55	10.40	59.33
Arizona	.28	.54	.89	.50	.10	.15	2.88	1.63	.02	.19	.40	.26	6.84
Arkansas	3.66	3.08	7.37	7.10	7.59	.63	4.65	1.59	.99	1.48	2.16	3.15	43.45
California	4.45	.51	2.32	2.22	1.37	.51	.06	.25	.04	.74	2.66	1.04	16.17
Colorado	.51	1.09	1.68	1.77	.51	.94	2.31	2.02	.14	1.23	1.12	.70	14.15
Connecticut	6.44	3.03	10.14	5.76	4.38	2.53	4.33	1.91	1.83	4.63	3.55	5.51	54.04
Delaware	4.51	3.08	5.25	4.43	5.39	2.75	3.64	6.65	2.17	4.00	2.73	3.53	48.13
Florida	3.38	3.41	2.96	6.39	1.60	7.92	7.57	9.51	10.52	5.42	3.57	5.87	68.18
Georgia	4.47	6.24	3.61	5.29	4.18	4.76	6.98	3.84	8.27	.79	1.58	8.63	58.64
Idaho	3.98	1.53	1.20	1.64	2.49	1.67	.12	.54	.18	.48	1.65	1.75	17.23
Illinois	1.86	1.53	4.61	2.92	3.02	3.42	3.67	1.12	1.59	1.56	.90	1.74	27.94
Indiana	3.07	1.35	4.33	3.26	4.03	2.72	4.40	2.06	1.20	1.31	1.45	1.99	31.17
Iowa	.76	1.72	2.92	3.13	2.32	5.31	3.28	2.33	.95	.48	1.33	1.34	25.87
Kansas	.19	.66	2.03	1.82	2.62	2.29	2.94	2.03	1.21	1.71	2.06	1.33	20.89
Kentucky	4.65	2.09	5.49	3.90	5.42	3.42	3.74	1.54	1.17	.91	1.48	2.72	36.53
Louisiana	3.18	6.81	5.17	7.88	13.13	3.63	5.89	4.65	.96	1.29	4.62	8.41	65.62
Maine	4.18	3.38	8.26	4.65	3.04	2.32	3.56	3.13	2.85	4.53	4.10	4.32	48.32
Maryland	4.41	2.65	5.94	3.86	6.10	2.31	3.34	3.81	3.13	2.65	2.02	3.40	43.62
Massachusetts	6.21	3.78	8.27	5.55	4.66	1.59	3.38	2.61	2.40	5.18	5.02	4.83	53.48
Michigan	1.84	2.08	2.12	3.15	3.09	3.77	3.40	2.96	2.57	1.37	1.53	1.95	29.83
Minnesota	.95	.95	1.37	3.02	4.17	6.18	4.33	4.67	1.71	.57	1.50	1.26	30.68
Mississippi	4.46	7.86	5.71	7.92	7.88	2.45	5.65	3.13	1.03	.63	2.56	7.58	56.86
Missouri	1.57	1.65	4.51	3.82	2.97	2.14	1.92	1.31	1.22	2.02	1.01	1.39	25.53
Montana	1.34	.88	.64	1.70	3.81	3.33	.71	1.02	.64	.72	.52	.84	16.15
Nebraska	.43	1.11	1.01	3.07	2.55	3.22	2.71	1.93	.76	.99	1.63	1.02	20.43
Nevada	.55	.22	.38	.60	.99	.52	.41	.38	.05	.53	.29	.42	5.34
New Hampshire	4.67	2.64	7.86	4.40	4.37	1.22	2.85	4.04	2.06	3.97	3.17	3.88	45.13
New Jersey	5.32	2.60	6.99	5.49	5.72	2.83	3.91	3.42	1.49	3.70	2.94	4.37	48.78
New Mexico	.15	.59	.68	.56	.72	.63	2.68	1.64	.17	.93	.61	.46	9.52
New York	3.36	2.04	4.37	3.52	5.25	1.98	3.07	3.06	3.35	2.37	2.18	3.22	37.77
North Carolina	3.78	5.15	4.36	2.89	3.16	5.80	2.86	4.47	4.97	.52	2.49	5.40	45.85
North Dakota	.43	.95	3.46	2.89	3.16	5.80	2.86	4.47	4.97	.52	2.49	5.40	45.85
Ohio	3.82	1.24	2.67	2.86	4.22	2.81	3.54	2.10	1.49	2.74	1.22	1.93	28.64
Oklahoma	.63	1.11	3.68	4.04	2.72	2.21	5.72	2.30	1.54	4.55	1.65	1.29	31.44
Oregon	8.32	3.71	3.17	2.00	3.52	1.78	.05	1.42	.56	1.80	5.35	5.14	36.82
Pennsylvania	4.32	2.11	4.66	4.04	6.88	2.88	3.52	1.94	3.28	1.99	2.21	3.28	41.11
Rhode Island	6.57	4.45	8.22	6.19	3.65	.75	4.77	4.13	2.83	4.91	6.23	5.74	58.44
South Carolina	3.20	5.69	4.61	2.03	3.56	4.61	3.74	4.41	6.33	.50	1.63	7.05	47.36
South Dakota	.61	1.17	1.26	3.57	2.76	4.79	2.76	2.18	2.80	.49	.82	.71	21.84
Tennessee	5.31	5.84	6.11	5.16	6.16	2.51	5.13	.94	1.94	.78	1.47	4.23	45.58
Texas	.63	1.32	1.80	2.28	3.13	1.11	2.20	3.42	1.36	3.63	1.13	1.71	23.72
Utah	1.36	1.90	1.90	1.41	1.00	1.11	1.21	1.22	1.11	.43	.83	.72	10.79
Vermont	3.78	2.03	4.82	4.06	4.73	1.82	2.44	3.67	2.84	2.97	1.94	3.48	38.58
Virginia	3.36	3.05	4.75	3.41	4.20	3.76	2.37	3.16	2.79	1.76	1.47	3.47	37.55
Washington	10.52	2.75	2.65	2.29	2.37	1.94	.35	1.42	1.34	2.53	4.86	6.33	39.35
West Virginia	4.54	2.66	4.00	3.29	4.32	4.27	3.17	2.53	2.00	.84	1.23	2.68	35.53
Wisconsin	.89	2.15	1.84	3.72	2.99	4.92	4.04	3.99	1.38	.40	1.44	1.82	29.94
Wyoming	1.03	1.00	.56	1.51	1.79	1.64	.91	1.28	.37	.50	.54	.16	11.90
Alaska	2.86	.98	1.84	1.18	1.87	1.15	1.77	1.30	1.57	2.45	4.15	2.08	22.17
Hawaii	1.80	5.39	8.21	2.82	5.28	2.89	3.09	3.57	1.81	2.65	4.45	5.55	47.51
Puerto Rico	2.10	1.12	2.22	3.06	6.00	6.62	5.55	7.54	8.04	8.33	5.13	4.62	60.33

# PERCENT OF NORMAL PRECIPITATION

YEAR 1953

Table 5

Section	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	110	140	60	171	108	94	109	53	143	23	75	207	111
Arizona	28	43	91	77	31	43	172	77	1	23	56	20	62
Arkansas	82	86	155	144	149	15	124	44	30	46	57	75	89
California	112	13	70	131	163	170	60	167	11	57	115	26	72
Colorado	69	50	80	97	101	65	114	106	10	100	135	74	86
Connecticut	166	88	246	154	114	71	110	46	48	132	93	143	119
Delaware	126	136	171	146	73	78	137	64	73	129	91	103	109
Florida	125	111	88	206	42	119	101	134	153	128	160	208	128
Georgia	110	134	72	136	122	107	119	73	212	30	60	204	117
Idaho	198	89	71	120	157	127	20	93	18	34	85	89	100
Illinois	80	80	144	82	73	85	114	33	44	58	34	81	76
Indiana	102	56	116	91	98	69	132	62	37	47	48	73	79
Iowa	75	158	173	120	59	117	91	62	24	21	77	123	82
Kansas	29	67	144	69	58	109	71	65	41	84	148	156	79
Kentucky	102	60	114	99	136	82	90	42	40	35	43	71	60
Louisiana	63	153	110	167	277	85	104	99	26	38	119	147	119
Maine	124	115	235	148	94	67	106	97	80	127	113	129	120
Maryland	131	91	165	110	163	58	78	86	92	89	73	107	104
Massachusetts	167	112	210	155	135	45	97	71	66	154	136	134	124
Michigan	102	127	104	131	92	11	124	101	78	52	61	102	97
Minnesota	128	127	114	147	132	151	130	142	61	31	127	166	122
Mississippi	85	156	95	162	182	59	112	77	32	25	61	142	109
Missouri	68	79	138	95	62	45	54	35	31	69	37	64	63
Montana	184	144	74	149	191	119	51	92	50	73	67	112	112
Nebraska	78	161	89	129	74	85	88	71	36	67	212	144	89
Nevada	52	22	42	77	127	100	105	76	12	82	45	45	62
New Hampshire	154	98	236	141	122	34	77	115	56	127	94	125	114
New Jersey	146	76	182	151	147	75	82	73	41	107	86	121	107
New Mexico	24	92	100	73	61	53	105	70	9	84	113	64	69
New York	117	70	139	117	143	55	79	88	97	74	71	110	97
North Carolina	104	131	105	83	80	124	47	81	121	16	89	145	93
North Dakota	90	70	122	161	180	155	61	86	56	106	59	127	117
Ohio	120	52	77	68	113	71	94	63	51	30	45	71	76
Oklahoma	41	69	161	117	56	55	205	79	49	154	81	75	94
Oregon	214	112	109	97	201	124	11	323	47	81	136	121	133
Pennsylvania	134	76	131	116	169	70	81	88	65	74	105	149	136
Rhode Island	163	127	200	162	127	100	163	110	86	144	64	149	136
South Carolina	9	140	114	102	102	99	6	77	151	15	78	196	109
South Dakota	111	213	114	172	97	15	90	132	32	68	88	133	114
Tennessee	105	129	113	119	159	59	114	24	61	28	40	93	91
Texas	39	85	102	91	92	40	88	146	4	146	61	84	66
Utah	116	43	58	111	92	81	126	109	11	90	89	85	82
Vermont	135	62	164	157	141	49	64	105	77	95	61	125	100
Virginia	102	101	173	104	110	51	60	71	85	60	51	107	89
Washington	241	71	88	106	125	120	51	200	82	91	104	127	123
West Virginia	124	86	102	91	107	94	69	62	67	31	44	82	82
Wisconsin	72	179	114	151	85	117	129	116	37	17	76	146	99
Wyoming	123	128	52	96	90	65	72	122	31	47	69	73	83
Alaska	47	155	78	91	97	91	66	153	92	91	74	109	95
Hawaii	22	82	96	36	96	70	59	69	36	47	66	66	61
Puerto Rico	55	35	65	73	122	111	84	104	95	109	73	107	78

# PERCENT OF ANNUAL PRECIPITATION

Table 6

(For past years)

Section	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953
Alabama	80	119	90	103	92	114	109	91	111	101	86	100	89	112	106	124	114	125	106	96	100	89	111
Arizona	142	98	86	76	112	103	94	92	93	125	153	69	90	99	82	100	69	77	97	54	115	112	62
Arkansas	97	105	101	88	118	72	114	100	104	93	96	103	72	114	139	121	84	115	117	122	109	88	89
California	102	65	84	75	92	84	121	125	66	50	151	100	100	114	75	57	88	70	123	111	132	72	72
Colorado	85	86	92	86	96	97	88	117	107	136	113	86	109	102	102	110	93	102	74	99	66	66	66
Connecticut	90	107	99	116	79	117	120	133	94	104	81	115	85	90	112	103	87	112	103	85	97	114	119
Delaware	93	112	119	124	124	115	115	111	104	99	77	102	98	101	125	90	95	131	92	92	102	116	109
Florida	81	100	104	99	98	108	110	81	102	98	110	100	90	100	104	103	137	118	102	91	90	91	128
Georgia	75	116	83	97	89	118	105	84	98	94	85	106	94	108	108	111	119	127	96	89	91	91	117
Idaho	83	108	103	89	68	91	110	108	76	121	119	111	92	89	121	114	101	118	86	115	112	78	100
Illinois	103	99	95	90	114	86	100	110	97	78	108	112	95	92	125	109	101	100	112	117	119	92	76
Indiana	96	109	104	76	100	86	117	105	99	83	83	105	95	86	127	92	102	105	115	130	109	98	79
Iowa	111	102	79	85	104	82	87	114	79	97	116	103	98	117	109	109	111	89	89	93	135	95	82
Kansas	96	88	82	74	106	68	77	101	75	95	137	123	91	139	112	105	102	109	120	131	156	70	79
Kentucky	93	109	112	82	127	84	110	102	105	86	74	110	73	89	113	101	92	111	114	159	119	91	80
Louisiana	94	111	97	105	101	81	104	86	91	132	107	101	92	129	109	130	112	100	109	101	87	86	119
Maine	100	99	102	99	95	123	105	107	89	100	76	100	106	95	115	92	91	93	89	127	126	95	120
Maryland	92	112	117	107	112	105	124	96	103	104	78	115	84	101	120	89	92	132	99	102	102	122	104
Massachusetts	191	107	115	105	92	119	114	129	88	102	76	110	90	97	117	95	95	106	81	93	112	97	124
Michigan	98	139	99	84	94	89	102	103	99	107	106	115	105	94	116	90	108	92	105	114	122	97	97
Minnesota	88	85	81	80	101	72	102	112	86	120	11	114	107	117	108	111	100	89	106	103	123	89	122
Mississippi	98	127	84	100	97	83	104	92	101	114	81	91	78	114	111	123	109	123	114	112	104	77	106
Missouri	100	94	91	87	119	73	92	101	94	80	104	114	94	96	132	109	96	108	119	102	125	81	63
Montana	67	107	107	77	72	77	87	109	63	99	114	110	98	101	97	113	106	110	83	107	110	74	112
Nebraska	85	91	90	63	100	64	78	98	72	77	108	111	76	121	100	109	103	94	112	100	137	91	89
Nevada	89	92	74	79	96	114	99	131	94	123	149	82	109	95	126	109	64	72	89	95	95	107	61
New Hampshire	104	106	114	107	102	131	123	125	98	111	83	109	112	101	125	105	103	100	93	106	125	106	114
New Jersey	81	103	109	100	93	104	104	115	94	106	82	111	86	103	115	87	101	116	87	97	109	120	107
New Mexico	126	112	89	70	102	95	11	101	91	104	195	198	80	101	69	93	76	93	107	74	69	64	69
New York	97	107	96	89	97	102	111	106	87	103	81	112	190	95	125	94	110	103	87	104	108	96	97
North Carolina	98	106	79	108	97	121	106	97	99	91	78	104	88	198	110	99	103	114	109	92	83	100	93
North Dakota	88	100	79	56	105	52	99	90	83	102	136	110	107	125	87	97	106	102	95	106	97	72	117
Ohio	101	98	102	70	107	85	118	104	99	101	83	101	94	88	118	95	108	111	99	126	110	93	76
Oklahoma	96	103	93	83	112	94	96	101	81	103	143	121	86	111	127	106	96	97	118	104	166	71	94
Oregon	93	101	107	98	78	88	132	100	79	112	113	118	91	76	121	104	102	132	86	135	114	83	133
Pennsylvania	89	95	108	93	96	101	111	96	88	104	81	114	90	96	117	94	98	109	91	113	105	111	97
Rhode Island	94	122	116	92	89	120	103	112	90	94	76	106	72	95	97	88	112	109	82	93	106	98	136
South Carolina	76	112	75	93	89	119	106	85	97	90	93	89	92	101	116	94	116	124	102	88	82	98	100
South Dakota	65	108	91	65	81	99	89	83	74	80	126	121	86	114	91	144	86	104	99	94	116	75	114
Tennessee	87	129	103	95	100	95	113	109	100	86	74	102	84	109	116	109	89	116	115	127	116	84	91
Texas	94	110	84	86	121	99	86	87	79	79	113	149	107	82	116	108	122	86	80	114	83	76	83
Utah	75	100	79	71	81	127	110	113	86	118	155	94	105	112	136	125	124	96	111	78	109	92	82
Vermont	104	104	102	101	100	121	117	120	96	109	83	107	110	98	133	104	112	100	91	111	104	102	100
Virginia	91	107	91	106	110	108	127	117	106	104	116	83	90	107	103	96	125	108	130	91	110	99	91
Washington	122	129	137	111	84	94	125	85	93	104	98	96	79	74	112	100	105	128	87	118	109	67	123
West Virginia	99	102	113	87	119	98	116	99	101	104	84	113	93	104	117	85	85	15	105	118	107	97	82
Wisconsin	97	84	89	100	99	83	90	136	86	107	111	115	96	95	115	97	98	79	92	101	126	95	99
Wyoming	81	93	85	76	86	92	109	107	72	102	127	108	87	109	122	109	117	89	96	96	98	78	89



# EXCESSIVE PRECIPITATION

(Excessive Short Duration Rainfall)

YEAR 1953

This table contains statistics of maximum amounts of rainfall during the calendar year 1951. Data presented in this table are generally from stations equipped with tipping bucket recording gages. Stations are at City Office locations unless otherwise shown.

Excessive precipitation data for the years 1896-1935 inclusive, generally present the accumulated amounts of precipitation for each 5, 10, or 20 minute intervals during storms in which the rate of fall equaled or exceeded .25 inch in any 5 minute period, or .30 in any 10 minute period, or .35 in any 15 minute period, etc., the tabulation beginning with the 5 minute period where the rate of .05 inch in 5 minutes began and continuing by 10 or 20 minute intervals up to 120 minutes. A detailed explanation of the method used may be found in the publications listed in the last paragraph of this explanation.

The present method, adopted with data for the calendar year 1936, gives the maximum fall of precipitation for the periods 5 to 180 minutes, the maximum amounts being taken for the periods in which the fall is greatest for the given time, and is tabulated to show maximum amounts for 5, 10, 15, 20, 30, 45, 60, 80, 100, 120, 150 and 180 minutes, even if the fall does not equal the excessive rate for some of the periods. (The 15 minute amount was not computed for 1936-43 and the 150 minute amount was not computed for 1944 through 1948).

The following Table A shows limits at which precipitation was considered excessive in this publication:

TABLE A

Dura- tion (minutes)	Depth of precipi- tation (inches)	Dura- tion (minutes)	Depth of precipi- tation (inches)
5	.25	60	.80
10	.30	80	1.00
15	.35	100	1.20
20	.40	120	1.40
30	.50	150	1.70
45	.65	180	2.00

This table is made up from the formula,  $A = t + 20$  where A is the accumulated depth in hundredths of inches and t is the time in minutes.

For the years 1936 through 1948 stations in North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Arkansas, Louisiana, Texas, Oklahoma, and San Juan, P. R. used the limits shown in the following Table B:

TABLE B

Dura- tion (minutes)	Depth of precipi- tation (inches)	Dura- tion (minutes)	Depth of precipi- tation (inches)
5	.40	60	1.50
10	.50	80	1.90
15	.60	100	2.30
20	.70	120	2.70
30	.90	150	3.30
45	1.20	180	3.90

This table is made up from the formula  $A = 2t + 30$ . Its use, however, was discontinued at the end of 1948 and Table A is used by all sections for 1949 and the following years.

Publication of Data. A summary of maximum precipitation data for the years prior to 1896 is published in the annual report of the Chief of the Weather Bureau for 1895-1896. Excessive precipitation data for the period 1881-1896 are published in the annual report of the Chief of the Weather Bureau 1896-1897. Data for the years 1897 through 1934 have been published in the appropriate annual reports of the Chief of the Weather Bureau. For the years 1935 through 1949 these data are published in the appropriate issue of the United States Meteorological Yearbook. For 1950 and succeeding years excessive precipitation are presented in the annual issues of the Climatological Data, National Summary.

# EXCESSIVE SHORT DURATION RAINFALL

Table 8

YEAR 1953

Station and date	Maximum precipitation in inches (5 to 180 minutes)													
	5	10	15	20	30	45	60	80	100	120	150	180		
<b>ALABAMA</b>														
Birmingham Airport														
Jan. 8	0.17	0.26	0.34	0.45	0.52	0.61	0.65	0.71	0.78	0.83	0.90	0.90		
Jan. 8	.24	.34	.41	.52	.55	.58	.63	.70	.73	.77	.19	1.30		
Jan. 23	.23	.37	.52	.58	.63	.70	.79	.94	1.03	1.14	1.23	1.27		
Mar. 14	.31	.41	.51	.61	.64	.66	.94	1.05	1.07	1.07	1.07	1.07		
Apr. 29	.38	.68	1.00	1.16	1.38	1.58	1.73	1.86	1.92	1.93	1.94	1.95		
May 3	.42	.60	.66	.70	.77	.79	.80	.85	.88	.88	.88	.92		
July 17	.27	.32	.33	.33	.33	.33	.33	.39	.56	.63	.64	.64		
Aug. 17	.25	.45	.58	.70	.91	.93	.94	.94	.94	.94	.94	.94		
Sept. 4	.37	.69	.78	.78	.80	.88	.88	.88	.88	.88	.88	.88		
Sept. 19	.28	.47	.56	.66	.71	.77	.83	.89	.98	1.03	1.14	1.22		
Dec. 9	.15	.24	.32	.40	.61	.82	.92	.99	1.08	1.12	1.20	1.26		
Mobile*														
Jan. 8	.30	.44	.54	.58	.89	1.00	1.30	1.47	1.91	1.97	1.97	1.97		
Jan. 17	.14	.21	.29	.36	.53	.69	.69	.70	.70	.78	.92	.95		
Feb. 14	.19	.28	.41	.50	.73	.98	1.13	1.29	1.39	1.52	1.63	1.85		
Mar. 18	.46	.51	.57	.60	.62	.67	.76	.82	.83	.84	.93	.93		
Apr. 11	.24	.27	.47	.60	.60	.60	.60	.60	.60	.60	.60	.60		
Apr. 24-25	.23	.39	.42	.49	.54	.54	.55	.57	.57	.59	.62	.62		
Montgomery Airport														
Apr. 25	.12	.22	.31	.42	.52	.59	.64	.82	.86	1.00	1.07	1.12		
Apr. 30	.44	.76	.79	1.12	1.26	1.61	2.23	2.63	2.80	2.84	2.88	2.90		
June 26	.22	.36	.46	.49	.51	.52	.52	.53	.53	.53	.53	.53		
June 29	.25	.28	.28	.28	.28	.28	.28	.28	.28	.28	.28	.28		
July 1	.20	.34	.43	.49	.57	.67	.71	.72	.72	.72	.72	.72		
July 2	.37	.70	.88	.99	1.10	1.18	1.19	1.19	1.19	1.19	1.19	1.19		
Aug. 16	.31	.49	.79	.83	.84	.85	.97	1.09	1.09	1.09	1.09	1.09		
Sept. 19	.32	.53	.66	.74	.75	.77	.83	1.24	1.28	1.28	1.32	1.32		
Sept. 26	.13	.26	.37	.45	.61	.89	1.15	1.50	1.75	2.00	2.41	2.81		
Nov. 20	.20	.31	.32	.35	.42	.45	.47	.50	.55	.61	.70	.79		
Dec. 3	.19	.31	.43	.45	.59	.70	.72	.74	.76	.77	.77	.89		
Dec. 3	.19	.29	.39	.48	.59	.68	.77	.82	.83	.86	.92	1.03		
Dec. 4	.33	.48	.56	.58	.61	.71	.87	1.04	1.11	1.13	1.18	1.18		
Dec. 4	.28	.33	.34	.34	.34	.41	.49	.54	.55	.56	.56	.56		
<b>ARIZONA</b>														
Phoenix														
Prescott Airport														
Aug. 25	.22	.31	.31	.33	.34	.34	.39	.41	.45	.55	.72			
Tucson Airport														
July 29	.20	.30	.39	.51	.67	.71	.72	.73	.73	.73	.73	.73		
Winslow Airport														
Yuma Airport														
<b>ARKANSAS</b>														
Fort Smith Airport														
Feb. 20	.35	.46	.49	.52	.55	.58	.58	.58	.58	.58	.58	.58		
Mar. 14	.20	.32	.38	.41	.47	.63	.79	.99	1.09	1.13	1.26	1.39		
Mar. 17	.26	.46	.49	.53	.71	1.11	1.32	1.43	1.64	1.73	1.79	2.17		
Mar. 30	.18	.30	.40	.44	.52	.55	.62	.64	.66	.67	.67	.67		
Apr. 23	.23	.45	.67	.76	.79	1.04	1.10	1.24	1.26	1.30	1.49	1.63		
July 19	.23	.38	.56	.67	.72	.75	.76	.77	.77	.77	.77	.77		
July 20	.25	.40	.58	.63	.70	.88	1.04	1.10	1.11	1.12	1.31	1.33		
July 20	.16	.31	.36	.37	.37	.38	.39	.49	.50	.50	.50	.50		
July 21	.31	.44	.47	.47	.47	.47	.47	.47	.47	.47	.47	.47		
Aug. 18	.18	.34	.42	.50	.74	.78	.80	.81	.84	.85	.86	.86		
Aug. 30	.17	.22	.39	.47	.49	.56	.58	.59	.59	.60	.60	.60		
Dec. 3	.34	.47	.54	.62	.71	.77	.81	.86	.90	.95	.96	1.00		
Little Rock Airport														
Jan. 7	.26	.35	.39	.50	.52	.58	.89	1.08	1.10	1.14	1.20	1.20		
Mar. 12	.40	.75	.87	.92	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02		
Mar. 21	.23	.44	.47	.48	.57	.82	.94	.97	1.05	1.15	1.15	1.15		
Mar. 22	.15	.23	.35	.43	.63	.74	.75	.76	.77	.77	.77	.77		
Apr. 18	.22	.37	.45	.45	.45	.45	.45	.45	.45	.45	.45	.45		
Apr. 24	.30	.52	.58	.68	.75	.81	.85	.90	1.04	1.13	1.20	1.25		
Aug. 17	.27	.45	.60	.73	.84	1.10	1.40	1.50	1.52	1.52	1.52	1.52		
Sept. 18	.20	.38	.52	.55	.57	.60	.63	.65	.65	.65	.65	.65		
Nov. 19	.22	.42	.47	.48	.52	.55	.63	.67	.70	.75	.76	.77		
Texarkana Airport														
Jan. 31	.21	.35	.42	.48	.68	.81	1.08	1.37	1.73	1.80	1.99	2.05		
Mar. 22	.35	.50	.55	.56	.57	.58	.58	.58	.58	.58	.58	.58		
Apr. 5	.20	.35	.40	.47	.64	.72	.84	1.07	1.17	1.23	1.33	1.46		
Apr. 23	.40	.72	1.00	1.14	1.33	1.52	1.63	1.78	1.90	1.94	1.99	2.05		
Apr. 24	.30	.33	.35	.37	.38	.40	.44	.47	.49	.52	.58	.62		
Apr. 28	.19	.34	.41	.48	.74	.85	.93	1.01	1.10	1.20	1.30	1.38		
May 11	.19	.35	.47	.54	.78	.83	.85	.87	1.00	1.02	1.02	1.13		
May 16	.26	.45	.50	.51	.52	.53	.63	.68	.98	1.20	1.24	1.25		
May 19	.45	.55	.58	.59	.59	.59	.59	.60	.60	.60	.60	.60		
July 6	.17	.27	.40	.50	.70	1.00	1.25	1.30	1.37	1.46	1.49	1.50		
July 17	.35	.65	.90	1.05	1.35	1.60	1.90	2.20	2.56	2.75	2.85	2.85		
July 19	.28	.38	.39	.40	.45	.46	.46	.46	.46	.46	.46	.46		
Aug. 6	.22	.31	.33	.34	.35	.35	.35	.35	.35	.35	.35	.35		
Aug. 18	.25	.31	.36	.38	.55	.70	.80	1.10	1.32	1.47	1.55	1.69		
Nov. 19	.25	.42	.44	.47	.50	.52	.57	.59	.61	.63	.63	.63		
<b>CALIFORNIA</b>														
Bakersfield														
Blue Canyon Airport														
Burbank														
Eureka														
Fresno Airport														
Los Angeles														
Red Bluff Airport														
Apr. 27	.25	.43	.59	.74	.92	.97	.98	.99	.99	.99	.99	.99		
Apr. 30	.11	.19	.28	.35	.55	.65	.74	.76	.77	.77	.77	.77		
May 23	.26	.34	.43	.52	.56	.56	.57	.57	.57	.57	.57	.57		

Station and date		Maximum precipitation in inches (5 to 180 minutes)												
		5	10	15	20	30	45	60	80	100	120	150	180	
CALIFORNIA (Cont'd.)														
Sacramento							None							
San Diego Airport							None							
San Francisco							None							
COLORADO														
Denver Airport														
June 5		0.28	0.37	0.38	0.40	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.42	
July 9		.20	.36	.41	.48	.72	.88	.98	1.00	1.01	1.02	1.04	1.06	
August 22		.15	.28	.37	.42	.50	.59	.60	.61	.64	.64	.65	.66	
Grand Junction AP														
Aug. 1		.15	.28	.33	.40	.52	.65	.88	.99	1.03	1.06	1.13	1.17	
Pueblo Airport														
Aug. 18		.62	1.11	1.30	1.40	1.66	1.70	1.70	1.71	1.71	1.71	1.71	1.74	
CONNECTICUT														
Bridgeport Airport														
June 29		.47	.67	.87	.92	.94	.94	.94	.94	.94	.94	.97	1.07	
July 23		Clock stopped; 3.45 in. fell in about 8 hours												
Sept. 15-16		.30	.50	.60	.63	.70	.73	.75	.75	.75	.75	.75	.75	
Hartford Airport														
June 22		.37	.57	.69	.95	.99	.99	1.05	1.24	1.52	1.53	1.55	1.66	
July 8		.33	.45	.60	.73	.77	.83	.87	.91	.92	.93	.93	.93	
New Haven Airport														
Mar. 25		.24	.33	.42	.45	.53	.63	.69	.93	1.12	1.18	1.18	1.20	
May 17		.23	.33	.41	.43	.46	.50	.54	.58	.60	.60	.61	.61	
July 1		.50	.78	.82	.83	.83	.83	.84	.85	.85	.85	.85	.88	
Sept. 15, 16		.34	.47	.58	.63	.72	.75	.78	.81	.82	.82	.83	.83	
Nov. 23		.39	.76	.89	.96	1.03	1.10	1.14	1.23	1.28	1.36	1.39	1.39	
DIST. OF COLUMBIA														
Washington														
May 14		.14	.26	.33	.35	.53	.59	.64	.67	.74	.76	.79	.80	
May 16		.26	.35	.43	.45	.47	.49	.50	.50	.50	.50	.50	.50	
June 28		.26	.46	.69	.83	.90	.95	.99	1.38	1.39	1.40	1.44	1.44	
July 2		.21	.32	.40	.59	.67	.89	.90	.90	.93	.95	.95	.95	
July 22		.24	.37	.41	.42	.43	.43	.43	.44	.44	.44	.44	.44	
July 22		.17	.30	.42	.47	.52	.61	.67	.70	.96	1.05	1.16	1.22	
Aug. 8		.27	.41	.50	.53	.86	1.04	1.29	1.60	1.60	1.60	1.60	1.60	
Sept. 5		.30	.50	.70	.83	1.01	1.11	1.17	1.19	1.20	1.21	1.22	1.23	
Sept. 6		.18	.35	.52	.65	.79	.93	1.08	1.18	1.40	1.63	1.71	1.74	
FLORIDA														
Apalachicola														
Jan. 23		.29	.48	.71	.81	1.06	1.24	1.30	1.42	1.50	1.64	1.70	1.78	
Feb. 7		.42	.57	.76	.95	1.04	1.04	1.04	1.06	1.09	1.09	1.14	1.26	
Feb. 14		.26	.46	.56	.61	.65	.71	.75	.78	.84	.85	.87	.96	
Apr. 6		.38	.49	.62	.77	.91	1.15	1.28	1.30	1.54	1.60	1.91	1.97	
Apr. 11		.21	.30	.36	.38	.38	.38	.38	.38	.38	.38	.38	.38	
Apr. 12		.27	.44	.51	.77	.95	1.27	1.57	1.85	2.19	2.22	2.27	2.31	
Apr. 25		.19	.26	.46	.49	.61	.78	.80	.86	.99	1.05	1.14	1.18	
May 5		.26	.46	.53	.57	.61	.69	.77	.83	.85	.87	.87	.87	
June 6		.19	.34	.50	.57	.83	1.09	1.27	1.38	1.45	1.53	1.57	1.65	
June 25		.35	.68	.89	1.03	1.09	1.12	1.14	1.15	1.15	1.15	1.15	1.50	
July 6		.44	.76	1.09	1.36	1.42	1.91	2.49	2.56	2.59	2.59	2.59	2.59	
July 24		.19	.30	.32	.33	.33	.33	.33	.33	.33	.33	.33	.33	
July 24		.42	.83	1.06	1.16	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	
Aug. 18		.36	.18	.36	.43	.44	.46	.47	.47	.47	.47	.47	.47	
Oct. 19		.13	.23	.32	.42	.46	.49	.50	.53	.56	.59	.64	.65	
Aug. 23		.18	.30	.35	.39	.47	.48	.81	.89	.91	.93	.93	.93	
Aug. 26		.15	.25	.42	.46	.51	.60	.72	.88	.91	.92	.92	.92	
Sept. 5		.25	.39	.43	.44	.52	.57	.60	.60	.60	.60	.60	.60	
Sept. 16		.19	.31	.40	.48	.57	.64	.66	.66	.66	.66	.66	.80	
Sept. 20		.18	.36	.51	.59	.70	1.17	1.30	1.35	1.37	1.38	1.39	1.39	
Sept. 25		.36	.63	.74	.80	.88	1.01	1.13	1.33	1.60	2.05	2.29	2.63	
Sept. 27		.29	.17	.29	.46	.55	.73	.85	1.10	1.58	1.74	2.20	2.40	
Oct. 27		.62	.48	.66	.74	.82	.94	.96	1.01	1.03	1.05	1.08	1.09	
Nov. 20		.25	.41	.54	.62	.69	.75	.79	.84	.88	.96	1.13	1.17	
Dec. 4		.29	.50	.72	.93	1.11	1.17	1.21	1.24	1.28	1.32	1.42	1.53	
Dec. 6		.17	.28	.41	.45	.50	.55	.57	.60	.62	.62	.62	.62	
Dec. 13		.19	.33	.53	.67	.81	.85	.86	.88	.89	.92	.95	.97	
Dec. 22		.24	.33	.43	.46	.48	.52	.57	.64	.70	.72	.75	.93	
Daytona Beach AP														
Feb. 2		.25	.45	.60	.80	.85	.97	1.09	1.12	1.26	1.28	1.30	1.43	
Feb. 15		.35	.37	.37	.37	.40	.40	.41	.44	.48	.48	.48	.48	
Mar. 11		.25	.45	.70	.73	.77	.91	.94	.94	.96	.96	1.03	1.06	
Mar. 22		.31	.59	.85	1.15	1.49	1.95	2.40	2.95	3.45	3.53	3.92	4.01	
Mar. 23		.23	.32	.45	.46	.46	.47	.52	.55	.55	.55	.55	.55	
Apr. 7		.50	.59	.63	.67	.81	.94	.98	1.02	1.06	1.09	1.12	1.31	
Apr. 13		.16	.32	.48	.63	.65	.67	.69	.69	.69	.69	.69	.69	
May 20		.25	.45	.72	.96	1.32	1.58	1.63	1.76	1.80	1.86	1.76	1.76	
July 23		.32	.48	.59	.65	.71	.72	.72	.74	.76	.77	.79	.79	
July 26		.20	.37	.45	.57	.71	.90	.97	1.00	1.02	1.05	1.07	1.09	
July 26		.25	.40	.52	.57	.62	.85	1.15	1.36	1.37	1.38	1.59	1.60	
July 27		.45	.63	.67	.68	.69	.69	.69	.69	.71	.72	.72	.72	
Aug. 4		.21	.39	.51	.63	.81	.87	.89	.91	.93	1.04	1.12	1.15	
Aug. 10		.35	.67	.85	.99	1.25	1.33	1.37	1.40	1.41	1.42	1.43	1.43	
Aug. 14		.25	.43	.63	.81	1.05	1.16	1.18	1.19	1.20	1.20	1.20	1.20	
Aug. 20		.45	.72	.96	1.32	1.58	1.63	1.76	1.80	1.86	1.76	1.76	1.76	
Aug. 21		.26	.40	.50	.62	.75	.85	1.28	1.63	1.72	1.73	1.74	1.74	
Aug. 23		.60	.95	1.21	1.28	1.29	1.30	1.30	1.31	1.31	1.32	1.32	1.40	
Aug. 25		.22	.35	.40	.57	.67	.95	1.06	1.25	1.40	1.57	1.63	1.70	
Aug. 26		.35	.48	.53	.65	.80	1.05	1.10	1.13	1.16	1.18	1.18	1.18	
Aug. 28		.16	.25	.37	.46	.52	.58	.64	.66	.70	.71	.72	.75	
Aug. 31		.23	.39	.60	.67	.72	1.04	1.10	1.18	1.21	1.23	1.42	1.57	
Sept. 26		.17	.27	.35	.47	.58	.75	.80	.80	.86	.86	.86	.86	
Sept. 27		.13	.20	.32	.35	.60	.75	.88	.98	1.04	1.11	1.13	1.15	
Sept. 29		.33	.50	.70	.77	.80	.82	.82	.82	.83	.84	.90	.90	
Sept. 30		.23	.33	.40	.45	.47	.50	.52	.56	.60	.60	.61	.61	
Oct. 8		.25	.45	.60	.65	.68	.69	.70	.70	.70	.70	.90	1.20	
Oct. 8		.12	.18	.25	.35	.58	.83	1.12	1.27	1.55	1.90	2.23	2.60	
Oct. 15		.16	.27	.36	.39	.40	.41	.42	.42	.42	.42	.42	.42	
Dec. 13		.29	.42	.60	.66	.69	.74	.79	.79	.79	.79	.79	.79	



Table 8-Continued

## EXCESSIVE SHORT DURATION RAINFALL

YEAR 1953

Station and date	Maximum precipitation in inches (5 to 180 minutes)														Station and date	Maximum precipitation in inches (5 to 180 minutes)													
	5	10	15	20	30	45	60	80	100	120	150	180	5	10		15	20	30	45	60	80	100	120	150	180				
FLORIDA (Cont'd.)																													
Fort Myers Airport													Miami (Cont'd.)																
Jan. 23	0.20	0.30	0.36	0.42	0.46	0.52	0.56	0.63	0.70	0.75	0.77	0.82	May 21	0.36	0.56	0.82	1.02	1.22	1.71	1.92	2.01	2.02	2.02	2.02	2.02				
Feb. 2	.50	.76	.81	.84	.86	.87	.87	.87	.87	.90	.90	.90	June 19	.33	.58	.75	.89	1.21	1.24	1.24	1.24	1.24	1.24	1.24	1.24				
Feb. 7	.25	.40	.42	.53	.59	.60	.60	.60	.60	.63	.63	.63	June 21	.52	.85	1.18	1.41	1.76	2.13	2.22	2.37	2.40	2.41	2.44	2.44				
Apr. 13	.13	.25	.36	.41	.45	.50	.51	.51	.53	.55	.55	.55	June 27	.16	.28	.42	.48	.51	.51	.51	.51	.51	.51	.51	.51				
May 22	.20	.35	.36	.38	.40	.40	.40	.40	.40	.40	.40	.40	June 27	.16	.28	.36	.41	.51	.63	.63	.63	.63	.63	.63	.63				
June 12	.25	.40	1.00	1.25	1.55	1.70	2.03	2.08	2.09	2.09	2.09	2.09	July 11	.17	.29	.36	.52	.58	.61	.66	.68	.73	.80	.91	.93				
June 18	.51	.90	1.10	1.30	1.65	1.98	2.44	2.76	3.22	3.63	4.63	4.85	July 22	.37	.71	.88	.99	1.17	1.25	1.31	1.37	1.43	1.52	1.56	1.56				
June 24	.20	.35	.55	.70	.81	1.25	1.44	1.50	1.56	1.62	1.71	1.77	Aug. 5	.24	.38	.43	.46	.50	.53	.55	.55	.56	.58	.60	.60				
June 26	.14	.25	.35	.44	.66	.70	.78	.88	.93	.99	1.04	1.06	Aug. 26	.20	.30	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32				
July 3	.20	.27	.35	.35	.35	.35	.35	.37	.37	.37	.37	.37	Aug. 28	.18	.36	.49	.66	.85	1.00	1.02	1.03	1.04	1.04	1.04	1.06				
July 4	.15	.27	.35	.38	.41	.41	.42	.43	.45	.46	.46	.46	Aug. 29	.26	.30	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31				
July 4	.15	.24	.29	.44	.62	.80	.94	.97	.99	.99	.99	.99	Aug. 30	.46	.71	.74	.80	.90	.91	.91	.91	.91	.91	.91	.91				
July 10	.19	.35	.42	.45	.55	.80	1.00	1.06	1.08	1.08	1.08	1.08	Sept. 17	.22	.32	.39	.46	.54	.70	.74	.79	.86	.92	.94	.96				
July 16	.35	.65	.81	.82	.82	.82	.82	.82	.82	.82	.82	.82	Sept. 18	.40	.59	.70	.75	.79	.81	.84	.84	.84	.84	.84	.84				
July 17	.45	.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Sept. 20	.42	.76	.85	.95	.99	1.09	1.43	1.97	2.09	2.13	2.16	2.16				
July 21	.40	.75	.94	1.05	1.16	1.21	1.23	1.25	1.25	1.25	1.25	1.25	Sept. 18	.30	.54	.64	.67	.67	.67	.67	.67	.67	.67	.67	.67				
July 23	.16	.28	.35	.40	.45	.58	.58	.58	.58	.58	.60	.60	Sept. 23	.32	.53	.75	.96	1.25	1.29	1.32	1.40	1.40	1.40	1.40	1.40				
July 30	.16	.26	.35	.43	.45	.53	.53	.53	.53	.53	.53	.53	Sept. 27	.30	.45	.49	.52	.54	.52	.50	.51	.71	.71	.71	.71				
Aug. 5	.29	.49	.62	.77	.88	.95	.99	1.02	1.06	1.12	1.20	1.26	Sept. 28	.42	.66	.78	.96	1.05	1.20	1.31	1.36	1.39	1.45	1.46	1.52				
Aug. 27	.35	.50	.64	.72	.76	.78	.78	.78	.78	.78	.78	.78	Oct. 7	.32	.55	.70	.87	1.32	1.69	2.09	2.40	2.55	2.71	2.87	2.94				
Sept. 5	.30	.55	.69	.74	.88	1.07	1.09	1.10	1.10	1.10	1.10	1.10	Oct. 14	.26	.31	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32				
Sept. 7	.19	.36	.54	.58	.67	1.17	1.40	1.40	1.45	1.45	1.46	1.48	Oct. 16	.19	.34	.42	.50	.72	.80	.82	.94	.95	.97	.97	.97				
Sept. 8	.30	.49	.60	.86	1.01	1.07	1.09	1.09	1.11	1.12	1.12	1.12	Oct. 17	.20	.32	.43	.50	.53	.54	.55	.56	.56	.56	.56	.56				
Sept. 11	.28	.45	.66	.74	.84	.90	.92	.93	.93	.93	.93	.93	Oct. 27	.23	.31	.38	.41	.47	.59	.72	.77	.87	.87	.87	.87				
*Sept. 14	(.39)	(.75)	(1.00)	(1.25)	(1.45)	(.52)	(1.53)	(1.53)	(1.53)	(1.53)	(1.53)	(1.53)	Dec. 23	.39	.75	.95	1.27	1.36	1.43	1.46	1.47	1.47	1.47	1.47	1.47				
Sept. 14	.39	.67	.79	.86	.89	.95	.98	1.01	1.09	1.14	1.15	1.15	Miami Airport																
Sept. 17	.30	.50	.56	.58	.58	.61	.66	.90	.91	.92	.92	.93	Jan. 8	.20	.25	.35	.40	.45	.45	.45	.45	.45	.50	.60	.60				
Sept. 27	.25	.42	.45	.48	.51	.58	.67	.99	1.05	1.14	1.22	1.28	Jan. 9	.25	.30	.37	.42	.45	.52	.60	.60	.60	.60	.60	.60				
Oct. 3	.13	.25	.34	.40	.41	.42	.42	.42	.42	.42	.42	.42	Jan. 24	.25	.31	.32	.34	.40	.42	.46	.50	.50	.50	.50	.50				
Dec. 23	.20	.36	.45	.47	.49	.50	.50	.54	.55	.58	.62	.65	Jan. 31	.20	.30	.40	.48	.55	.85	1.05	1.12	1.13	1.17	1.17	1.17				
Jacksonville													Feb. 8	.15	.25	.40	.54	.66	.72	.73	.73	.73	.73	.74	.74	.75			
Jan. 23	.37	.42	.44	.46	.46	.46	.46	.46	.47	.49	.69	.71	Mar. 16	.30	.35	.35	.40	.50	.51	.51	.51	.51	.51	.51	.51				
Apr. 19	.26	.38	.55	.56	.57	.60	.65	.75	.76	.76	.78	.80	Apr. 23	.20	.32	.37	.45	.60	.88	1.10	1.45	1.62	1.70	1.78	1.82				
June 14	.27	.32	.36	.38	.40	.41	.42	.42	.42	.42	.42	.42	Apr. 26	.16	.31	.40	.42	.50	.63	.68	.82	.97	1.03	1.14	1.22				
July 23	.55	.66	.75	1.15	1.44	1.52	1.55	1.59	1.60	1.61	1.62	1.63	May 20	.45	.75	.85	.93	1.05	1.14	1.16	1.16	1.16	1.16	1.16	1.16				
Aug. 4	.50	.70	1.00	1.15	1.28	1.49	1.54	1.64	1.68	1.71	1.72	1.74	June 5	.20	.30	.40	.45	.46	.48	.51	.58	.61	.64	.73	.73				
Aug. 10	.31	.51	.61	.66	.72	.77	.77	.77	.77	.77	.77	.77	June 13	.45	.70	.80	.85	.98	.98	.98	.98	.98	.98	.98	.98				
Aug. 16	.25	.50	.68	.85	1.04	1.05	1.05	1.05	1.05	1.05	1.05	1.05	July 21	.28	.41	.41	.66	.66	.74	.76	.78	.78	.78	.78	.78				
Aug. 20	.31	.33	.33	.34	.34	.44	.74	.85	.85	.85	.86	.91	July 22	.40	.50	.68	.85	1.15	1.50	1.77	1.90	1.90	1.90	1.90	1.92				
Aug. 21	.56	1.06	1.21	1.41	1.96	2.26	2.70	2.81	3.01	3.22	3.35	3.47	July 23	.25	.35	.38	.50	.53	.61	.64	.64	.64	.64	.64	.73				
Aug. 25	.21	.40	.55	.72	.96	1.16	1.21	1.26	1.31	1.34	1.36	1.38	Aug. 5	.35	.60	.95	1.15	1.40	2.10	2.40	2.50	2.56	2.57	2.58	2.58				
Aug. 26	.24	.29	.41	.47	.69	1.00	1.20	1.25	1.26	1.29	1.31	1.31	Aug. 17	.40	.60	.65	.70	.73	.75	.78	.78	.80	.83	.87	.87				
Aug. 31	.29	.38	.42	.43	.55	.60	.62	.64	.05	1.14	1.34	1.49	Aug. 20	.25	.50	.60	.63	.65	.65	.65	.65	.65	.65	.65	.65				
Sept. 23	.24	.30	.33	.36	.39	.41	.47	.57	.59	.94	1.10	1.31	Aug. 28	.20	.35	.50	.62	.75	.77	.78	.79	.80	.80	.85	.85				
Sept. 24	.29	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31	.36	Aug. 30	.25	.45	.70	.80	.83	.83	.83	.83	.84	.84	.84	.84				
Sept. 25	.21	.31	.40	.42	.46	.47	.60	.61	.61	.61	.67	.72	Sept. 7	.22	.35	.42	.45	.50	.51	.52	.53	.56	.62	.67	.68				
Sept. 26	.25	.40	.45	.60	.75	.90	1.04	1.07	1.09	1.11	1.13	1.14	Sept. 9	.30	.40	.48	.49	.49	.49	.49	.49	.49	.49	.49	.49				
Oct. 2	.40	.47	.48	.48	.49	.50	.50	.50	.50	.50	.50	.50	Sept. 17	.21	.30	.38	.50	.67	.77	.89	.89	.89	1.20	1.20	1.20				
Oct. 4	.25	.50	.50	.50	.50	.50	.50	.50	.50	.50	.50	.50	Sept. 18	.35	.60	.65	.75	.77	.93	.96	.96	.96	.96	.96	.96				
Nov. 5	.15	.28	.35	.40	.55	.67	.77	.80	.81	.90	1.13	1.13	Sept. 22	.30	.47	.53	.54	.55	.58	.60	.80	.87	1.10	1.12	1.12				
Dec. 7	.18	.32	.47	.62	.65	.74	.79	.82	.90	1.00	1.00	1.00	Sept. 23	.33	.60	.75	.85	.98	1.02	1.02	1.03	1.04	1.05	1.08	1.10				
Dec. 13	.43	.47	.49	.51	.53	.58	.63	.72	.74	.76	.78	.79	Sept. 28	.20	.30	.45	.50	.55	.58	.59	.61	.70	.85	.85	.95				
Dec. 22	.43	.53	.59	.70	.83	.86	.87	.88	.88	.89	.91	.99	Oct. 1	.24	.45	.55	.65	.80	.90	.92	.92	.92	.92	.92	.92				
Key West													Oct. 2	.30	.48	.50	.55	.55	.55	.57	.57	.57	.57	.57	.57	.57			
Jan. 9	.43	.67	.88	1.17	1.37	1.72	2.27	2.51	2.73	2.95	3.04	3.16	Oct. 7	.20	.30	.35	.42	.50	.65	1.00	1.10	1.20	1.25	1.70	2.00				
Feb. 2	.28	.48	.56	.60	.65	.69	.73	.80	.89	.93	1.00	1.04	Oct. 27	.25	.30	.50	.60	.70	.80	1.05	1.07	1.08	1.09	1.09	1.09				
Mar. 30	.14	.25	.31	.40																									

# EXCESSIVE SHORT DURATION RAINFALL

Table 8-Continued

YEAR 1953

Station and date	Maximum precipitation in inches (5 to 180 minutes)														
	5	10	15	20	30	45	60	80	100	120	150	180			
FLORIDA (Cont'd.)															
Pensacola (Cont'd.)															
June 22	0.17	0.29	0.38	0.44	0.51	0.54	0.54	0.54	0.57	0.60	0.66	0.69			
June 24	0.20	0.33	0.49	0.55	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57			
June 26	0.32	0.56	0.64	0.69	0.99	1.37	1.44	1.73	1.81	1.81	1.81	1.81			
June 27	0.18	0.30	0.44	0.54	0.68	1.06	1.27	1.39	1.70	1.87	1.90	1.94			
June 28	0.21	0.39	0.46	0.49	0.50	0.50	0.51	0.51	0.53	0.58	0.59				
July 9	0.16	0.27	0.38	0.41	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43			
July 21	0.19	0.36	0.47	0.53	0.60	0.67	0.72	0.80	0.86	0.91	0.94	0.96			
July 16	0.22	0.33	0.39	0.45	0.56	0.58	0.58	0.59	0.59	0.60	0.63	0.68			
July 31	0.28	0.44	0.56	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59			
Aug. 6	0.22	0.40	0.43	0.47	0.58	0.60	0.60	0.60	0.60	0.60	0.60	0.60			
Aug. 8	0.29	0.48	0.61	0.73	0.74	0.82	0.83	0.83	0.83	0.83	0.83	0.83			
Aug. 13	0.27	0.33	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35			
Aug. 14	0.23	0.46	0.64	0.82	1.08	1.20	1.24	1.32	1.34	1.34	1.35	1.42			
Aug. 16	0.21	0.28	0.35	0.40	0.45	0.51	0.58	0.61	0.61	0.61	0.61	0.61			
Aug. 20	0.16	0.24	0.31	0.41	0.50	0.62	0.63	0.65	0.65	0.65	0.65	0.65			
Aug. 27	0.37	0.58	0.79	0.89	0.94	1.03	1.08	1.12	1.14	1.17	1.18	1.21			
Sept. 4	0.18	0.30	0.40	0.44	0.46	0.46	0.46	0.48	0.48	0.48	0.48	0.48			
Sept. 26	0.12	0.19	0.27	0.36	0.49	0.72	0.92	1.04	1.66	1.90	2.11				
Nov. 20	0.38	0.60	0.72	0.78	0.88	0.97	1.03	1.06	1.14	1.20	1.29	1.36			
Nov. 22	0.29	0.48	0.68	0.80	0.92	1.06	1.16	1.25	1.31	1.40	1.45	1.53			
Dec. 3	0.36	0.46	0.49	0.57	0.66	0.78	0.79	0.79	0.79	0.90	0.93	0.94			
Dec. 6	0.26	0.44	0.66	0.70	0.72	0.82	0.83	0.90	0.94	0.97	0.98	0.99			
Dec. 11	0.19	0.30	0.36	0.41	0.51	0.71	0.90	1.04	1.18	1.36	1.46	1.54			
Dec. 20	0.20	0.34	0.48	0.57	0.73	0.85	0.92	1.00	1.23	1.41	1.63	1.70			
Dec. 22	0.42	0.73	0.93	1.08	1.18	1.28	1.30	1.44	1.53	1.55	1.72	1.73			
West Palm Beach															
Jan. 31	0.35	0.40	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42			
Apr. 18	0.25	0.45	0.57	0.62	0.74	0.77	0.78	0.78	0.78	0.79	0.88	1.08			
Apr. 26	0.22	0.39	0.48	0.53	0.73	0.77	0.79	0.80	0.81	0.81	0.81	0.81			
May 10	0.14	0.26	0.36	0.46	0.54	0.56	0.56	0.56	0.56	0.56	0.56	0.56			
May 20	0.18	0.28	0.35	0.43	0.47	0.50	0.53	0.54	0.55	0.55	0.55	0.55			
May 29	0.20	0.29	0.37	0.38	0.49	0.58	0.66	0.92	1.02	1.08	1.09	1.14			
June 1	0.20	0.35	0.41	0.42	0.42	0.50	0.50	0.50	0.50	0.54	0.54	0.59			
June 4	0.27	0.45	0.57	0.67	0.92	1.16	1.53	1.73	1.74	1.75	1.77	1.79			
June 16	0.26	0.32	0.43	0.60	0.71	0.77	0.83	0.84	0.84	0.84	0.84	0.84			
June 20	0.28	0.46	0.63	0.78	0.92	1.04	1.09	1.10	1.10	1.10	1.10	1.10			
June 21	0.29	0.42	0.51	0.56	0.57	0.57	0.57	0.57	0.57	0.59	0.61	0.65			
July 8	0.23	0.44	0.64	0.67	0.72	0.73	0.73	0.73	0.73	0.73	0.73	0.73			
July 12	0.23	0.32	0.37	0.38	0.38	0.46	0.49	0.49	0.51	0.52	0.63	0.79			
July 14	0.25	0.42	0.64	0.75	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77			
July 23	0.38	0.74	0.95	0.99	1.23	1.27	1.29	1.36	1.37	1.38	1.44	1.88			
July 27	0.14	0.25	0.32	0.45	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48			
July 30	0.31	0.47	0.57	0.58	0.97	1.00	1.01	1.01	1.01	1.01	1.01	1.01			
Aug. 7	0.34	0.60	0.80	0.91	0.93	1.01	1.14	1.31	1.33	1.35	1.35	1.35			
Aug. 10	0.35	0.47	0.53	0.65	0.76	0.85	0.85	0.85	0.85	0.96	0.97	0.97			
Aug. 16	0.26	0.43	0.59	0.68	0.69	0.74	0.80	1.15	1.18	1.18	1.18	1.18			
Aug. 16	0.28	0.55	0.58	0.59	0.59	0.60	0.60	0.60	0.60	0.62	0.93				
Aug. 20	0.36	0.39	0.40	0.41	0.43	0.45	0.53	0.72	0.72	0.72	0.72	0.72			
Aug. 21	0.30	0.35	0.37	0.37	0.37	0.37	0.37	0.42	0.42	0.42	0.42	0.42			
Aug. 28	0.16	0.25	0.34	0.43	0.49	0.50	0.66	0.95	1.09	1.11	1.12	1.12			
Aug. 29	0.26	0.50	0.66	0.76	0.98	1.06	1.07	1.08	1.08	1.13	1.18	1.18			
Aug. 29	0.30	0.57	0.82	0.95	1.13	1.14	1.32	1.40	1.46	1.46	1.46	1.46			
Sept. 10	0.27	0.46	0.56	0.63	0.94	1.18	1.33	1.42	1.46	1.50	1.52	1.65			
Sept. 16	0.22	0.40	0.50	0.58	0.67	0.76	0.83	0.83	0.83	0.83	0.83	0.83			
Sept. 17	0.47	0.80	1.03	1.24	1.44	1.64	1.75	1.81	1.86	1.90	2.03	2.24			
Sept. 20	0.37	0.48	0.49	0.52	0.61	0.64	0.64	0.65	0.65	0.66	0.66	0.66			
Sept. 23	0.25	0.45	0.52	0.54	0.55	0.55	0.55	0.56	0.56	0.56	0.56	0.56			
Sept. 28	0.22	0.27	0.36	0.39	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42			
Oct. 2	0.17	0.33	0.39	0.44	0.64	0.77	0.80	0.80	0.81	0.82	0.83	0.83			
Oct. 3	0.22	0.33	0.39	0.44	0.64	0.77	0.80	0.80	0.81	0.82	0.83	0.83			
Oct. 13	0.20	0.34	0.42	0.51	0.61	0.71	0.78	0.81	0.85	1.01	1.08	1.18			
Oct. 14	0.25	0.38	0.50	0.60	0.65	0.71	0.74	0.77	0.85	0.90	0.91	0.91			
Nov. 5	0.39	0.65	0.68	0.73	0.75	0.75	0.75	0.75	0.75	0.75	0.75	1.08			
Nov. 18	0.31	0.49	0.56	0.66	0.75	0.81	0.81	0.81	0.81	0.81	0.81	0.81			
GEORGIA															
Atlanta Airport															
Mar. 4	0.37	0.43	0.50	0.54	0.61	0.70	0.75	0.77	0.81	0.81	0.81	0.81			
Apr. 10	0.15	0.28	0.37	0.41	0.44	0.45	0.47	0.47	0.47	0.47	0.47	0.47			
Apr. 12	0.26	0.46	0.66	0.83	0.98	1.15	1.34	1.58	1.70	1.72	1.73	1.73			
Apr. 12	0.28	0.33	0.35	0.39	0.43	0.52	0.59	0.61	0.63	0.65	0.71	0.72			
Apr. 30	0.42	0.60	0.73	0.83	1.15	1.35	1.65	1.85	1.95	2.05	2.17	2.30			
May 6	0.26	0.41	0.48	0.49	0.49	0.49	0.49	0.49	0.56	0.62	0.68	0.70			
May 10	0.33	0.40	0.45	0.46	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47			
July 18	0.23	0.35	0.50	0.56	0.59	0.61	0.68	0.90	0.99	1.04	1.05	1.07			
July 21	0.20	0.39	0.47	0.49	0.52	0.56	0.60	0.64	0.66	0.67	0.67	0.67			
Sept. 3	0.72	1.04	1.16	1.18	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23			
Dec. 3	0.13	0.18	0.25	0.33	0.50	0.65	0.82	0.88	1.10	1.22	1.40	1.60			
Augusta Airport															
Jan. 23	0.26	0.44	0.46	0.53	0.58	0.64	0.66	0.69	0.73	0.76	0.79	0.80			
Feb. 15	0.12	0.21	0.32	0.41	0.49	0.62	0.77	0.88	1.08	1.20	1.36	1.47			
Apr. 10	0.27	0.35	0.45	0.51	0.56	0.57	0.58	0.60	0.61	0.64	0.66	0.66			
Apr. 30	0.25	0.46	0.49	0.49	0.57	0.63	0.75	0.85	0.87	0.88	0.88	0.89			
Apr. 30	0.25	0.45	0.50	0.51	0.51	0.51	0.51	0.51	0.51	0.91	0.96	0.96			
May 6	0.19	0.35	0.55	0.60	0.71	0.78	0.89	0.94	0.96	0.97	0.98	0.99			
June 6	0.22	0.31	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32			
June 14	0.23	0.38	0.47	0.56	0.68	0.76	0.78	0.79	0.80	0.80	0.80	0.80			
June 22	0.15	0.26	0.40	0.50	0.67	0.71	0.73	0.73	0.73	0.73	0.73	0.73			
June 30	0.17	0.29	0.33	0.43	0.54	0.67	0.69	0.69	0.69	0.69	0.69	0.69			
July 5	0.20	0.30	0.42	0.43	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47			
Aug. 4	0.22	0.35	0.42	0.48	0.50	0.52	0.52	0.52	0.94	1.00	1.00	1.00			
Aug. 8	0.27	0.34	0.43	0.52	0.65	0.67	0.70	0.71	0.71	0.71	0.71	0.71			
Aug. 18	0.30	0.51	0.66	0.75	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
Sept. 1	0.25	0.31	0.31	0.32	0.51	0.51	0.51	0.59	0.60	0.63	0.63	0.64			
Sept. 6	0.21	0.37	0.47	0.55	0.57	0.58	0.59</								



YEAR 1953

YEAR 1953

\* The 0.91 in 5 minutes exceeded the maximum capacity of this type gage.

## EXCESSIVE SHORT DURATION RAINFALL

YEAR 1953

Table 8-Continued

Station and date		Maximum precipitation in inches (5 to 180 minutes)											
		5	10	15	20	30	45	60	80	100	120	150	180
MICHIGAN (Cont'd.)													
Sault Ste. Marie AP (Cont'd.)													
June 20	0.20	0.28	0.35	0.37	0.39	0.41	0.41	0.42	0.43	0.44	0.49	0.49	
July 22	.20	.37	.49	.54	.55	.55	.55	.55	.55	.55	.55	.55	
Aug. 12	.15	.30	.41	.50	.52	.57	.58	.62	.63	.63	.63	.63	
Ypsilanti Airport													
June 25	.25	.39	.48	.51	.51	.51	.51	.52	.53	.53	.53	.53	
June 30	.40	.51	.58	.60	.59	.58	.58	.58	.58	.58	.58	.58	
July 6	.25	.45	.62	.82	1.01	1.08	1.12	1.17	1.20	1.20	1.21	1.21	
July 18	.29	.50	.55	.63	.67	.68	.69	.69	.69	.69	.69	.69	
Aug. 1	.28	.53	.72	.80	1.00	1.16	1.18	1.21	1.21	1.23	1.23	1.23	
Aug. 4	.25	.32	.40	.40	.52	.52	.52	.52	.52	.52	.52	.52	
Aug. 7	.26	.28	.30	.38	.41	.42	.42	.43	.43	.43	.43	.43	
MINNESOTA													
Duluth Airport													
May 10	.23	.33	.41	.58	.81	1.04	1.09	1.12	1.16	1.19	1.19	1.21	
July 1	.26	.31	.38	.47	.62	.66	.91	.98	.99	.99	.99	1.05	
July 12	.28	.32	.42	.50	.51	.51	.53	.55	.58	.64	.68	.74	
Aug. 6	.16	.26	.36	.41	.50	.53	.57	.86	1.02	1.11	1.19	1.22	
International Falls Airport													
June 21	.31	.41	.47	.49	.55	.74	.78	.81	.81	.81	.81	.81	
June 20	.38	.50	.63	.90	1.13	1.22	1.26	1.26	1.26	1.26	1.26	1.26	
June 24	.20	.23	.31	.40	.45	.56	.62	.65	.65	.65	.65	.65	
Aug. 27	.25	.44	.46	.47	.50	.51	.61	.85	.88	.88	.90	.91	
Sept. 2	.28	.36	.42	.45	.50	.64	.96	.98	1.04	1.08	1.13	1.13	
Minneapolis Airport													
June 19	---	---	---	---	---	---	1.03	1.03	---	---	---	---	
June 21	.24	.41	.59	.65	.72	.86	1.03	1.12	1.18	1.24	1.28	1.42	
June 27	.31	.52	.59	.63	.66	.75	.84	.95	.99	1.31	1.61	1.81	
July 12	.41	.57	.65	.74	.77	.86	.89	.89	.90	1.00	1.09	1.11	
July 17	.19	.37	.47	.65	.77	.81	.83	.95	1.15	1.17	1.22	1.24	
July 21	.27	.41	.54	.68	.81	.84	.84	.84	.81	.84	.85	.89	
July 26	.31	.44	.57	.64	.73	.78	.90	1.05	1.41	1.55	1.61	1.67	
Rochester													
June 21	.15	.28	.42	.45	.55	.56	.57	.57	.57	.57	.57	.57	
July 25	.25	.45	.55	.75	1.07	1.33	1.50	1.68	1.85	1.93	1.93	2.06	
July 26	.20	.30	.32	.37	.53	.54	.55	.55	.55	.57	.59	.59	
July 26	.22	.37	.49	.52	.59	.62	.65	.65	.66	.70	.70	.71	
July 31	.25	.37	.39	.40	.42	.49	.51	.63	.75	.78	.85	.95	
St. Cloud Airport													
June 13	.23	.37	.41	.60	.70	.74	.75	.77	.77	.77	.77	.77	
June 15	.35	.67	.84	1.07	1.17	1.27	1.65	2.12	2.29	2.48	2.57	2.67	
June 19	.20	.30	.39	.41	.46	.47	.47	.47	.47	.47	.47	.47	
June 19	.33	.56	.66	.73	.86	.97	.98	.98	.98	.98	.98	.98	
June 24	.33	.50	.58	.62	.77	.88	1.03	1.15	1.17	1.18	1.21	1.21	
MISSISSIPPI													
Jackson													
Jan. 8	.25	.35	.45	.57	.67	.72	.85	1.02	1.07	1.12	1.18	1.27	
Jan. 23	.16	.27	.32	.42	.57	.65	.85	1.03	1.07	1.17	1.23	1.25	
Feb. 6	.14	.20	.33	.42	.56	.66	.80	.92	.65	.73	.80	.86	
Feb. 20	.30	.35	.43	.50	.54	.60	.64	.72	.77	1.07	1.20	1.24	
Apr. 12	.16	.21	.27	.35	.52	.66	.70	.70	.70	.70	.70	.71	
Apr. 18	.20	.26	.37	.40	.40	.40	.40	.40	.40	.40	.40	.40	
Apr. 24	.30	.40	.45	.48	.50	.53	.55	.60	.66	.75	.85	.90	
Apr. 24	.43	.65	.78	.95	1.05	1.16	1.22	1.22	1.23	1.23	1.23	1.23	
Apr. 29	.23	.45	.63	.76	.95	.33	1.45	.82	2.40	2.80	3.12	3.18	
May 4	.28	.48	.55	.57	.59	.68	.75	.80	.82	.93	1.15	1.24	
May 19	.25	.43	.53	.57	.60	.61	.61	.62	.62	.62	.62	.62	
July 22	.22	.38	.47	.54	.70	.83	1.08	1.23	1.28	1.30	1.30	1.33	
July 27	.23	.31	.33	.38	.41	.41	.41	.41	.41	.41	.41	.41	
Aug. 8	.26	.40	.45	.63	.65	.65	.65	.80	.88	.89	.90	.92	
Aug. 28	.30	.55	.56	.57	.57	.57	.58	.59	.60	.60	.60	.60	
Dec. 3	.35	.50	.70	.78	.84	.95	1.00	1.10	1.25	1.36	1.53	1.65	
Meridian Airport													
Apr. 29	.30	.52	.70	.85	1.30	1.58	1.71	1.77	2.01	2.29	2.35	2.41	
June 9	.36	.56	.91	1.12	1.48	1.60	1.65	1.65	1.65	1.65	1.65	1.65	
July 20	.26	.44	.60	.85	1.02	1.07	1.12	1.15	1.23	1.30	1.31	1.34	
Aug. 1	.20	.38	.40	.54	.56	.57	.58	.58	.58	.58	.58	.58	
Dec. 3	.34	.43	.48	.54	.61	1.03	1.21	1.32	1.40	1.46	1.54	1.66	
Dec. 11	.50	.62	.72	.78	.88	1.41	1.50	1.51	1.51	1.51	1.53	1.53	
Vicksburg													
Jan. 22	.27	.46	.66	.73	.80	.89	.94	1.02	1.10	1.16	1.22	1.22	
Feb. 20	.36	.56	.68	.95	1.20	1.27	1.46	1.54	1.68	1.95	2.01	2.21	
Mar. 12	.44	.75	.87	1.03	1.15	1.20	1.39	1.42	1.42	1.42	1.42	1.42	
Apr. 12	.41	.70	.86	1.07	1.16	1.16	1.16	1.17	1.30	1.30	1.35	1.35	
Apr. 24	.22	.88	.96	1.12	1.21	1.23	1.25	1.31	1.38	1.45	1.54	1.57	
Apr. 29	.24	.44	.66	.70	.98	1.02	.28	1.53	1.77	1.93	2.14	2.31	
Apr. 29	.48	.61	.84	.97	1.15	1.33	1.65	2.44	2.61	3.17	3.62	4.51	
May 4	.25	.43	.53	.58	.60	.77	.81	.91	.95	.97	.97	.97	
May 16	.30	.48	.56	.57	.59	.60	.62	1.03	1.03	1.04	1.04	1.08	
May 17	.23	.28	.43	.48	.48	.51	.55	.61	.63	.63	.79	.92	
July 16	.23	.35	.40	.45	.52	.56	.56	.56	.56	.56	.56	.56	
July 20	.25	.36	.37	.38	.44	.46	.49	.54	.58	.58	.58	.58	
July 22	.25	.50	.59	.60	.61	.83	.83	1.04	1.08	1.09	1.09	1.09	
Aug. 15	.30	.47	.50	.52	.52	.52	.52	.52	.52	.52	.91	.96	
Aug. 21	.19	.33	.47	.55	.74	.86	.89	.92	.92	.95	.95	.96	
Aug. 28	.20	.36	.48	.52	.62	.64	.66	.66	.66	.66	.66	.66	
Nov. 22	.27	.45	.58	.76	.91	.97	1.00	1.03	1.14	1.17	1.26	1.30	
Dec. 3	.20	.33	.41	.50	.67	.81	.95	1.13	1.23	1.26	1.31	1.41	
MISSOURI													
Columbia													
Apr. 8	.28	.50	.59	.62	.86	.98	1.06	1.08	1.09	1.09	1.09	1.09	
Apr. 30	.30	.37	.41	.46	.48	.52	.55	.59	.60	.62	.66	.68	
July 4	.45	.65	.92	1.00	1.20	1.30	1.32	1.40	1.42	1.46	1.49	1.49	
Aug. 4	.48	.77	1.17	1.34	1.40	1.49	1.53	1.57	1.72	1.81	2.07	2.22	
Kansas City Airport													
St. Joseph													
Mar. 30	.36	.38	.40	.40	.41	.42	.45	.48	.53	.55	.56	.60	
Mar. 29	.30	.36	.38	.38	.38	.38	.38	.38	.38	.38	.38	.38	
July 5	.30	.48	.60	.70	.74	.76	.76	.77	.79	.79	.79	.79	
July 16	.32	.52	.60	.62	.62	.62	.63	.63	.63	.63	.63	.63	

[illegible]

\* Data interpolated.



## YEAR 195

YEAR 195

- 14 -

# EXCESSIVE SHORT DURATION RAINFALL

Table 8-Continued

YEAR 1953

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
<b>OKLAHOMA (Cont'd.)</b>												
Oklahoma City (Cont'd.)												
Apr. 3	0.23	0.37	0.42	0.43	0.48	0.66	0.77	0.87	1.17	1.34	1.62	1.74
Apr. 14	.23	.35	.40	.42	.43	.45	.45	.45	.45	.45	.45	.45
Aug. 18	.37	.55	.82	.92	1.22	1.52	1.70	1.80	1.81	1.82	1.83	1.85
Sept. 3	.15	.25	.37	.38	.40	.43	.46	.46	.47	.47	.48	.50
Oct. 15	.30	.56	.76	.77	.78	.80	.85	.87	.92	.94	.95	1.02
Dec. 2	.35	.40	.45	.55	.78	.90	.92	1.00	1.05	1.10	1.15	1.15
Tulsa Airport												
Mar. 3	.25	.26	.28	.29	.32	.40	.45	.52	.64	.75	.88	.94
Mar. 13	.19	.30	.32	.34	.39	.54	.60	.62	.64	.69	.74	.74
Mar. 14	.25	.40	.43	.45	.47	.50	.52	.56	.78	.82	1.24	1.30
Apr. 17	.33	.50	.67	.75	.93	.93	.93	.94	.94	.95	.95	.95
Apr. 23	.25	.47	.65	.68	.87	.98	1.30	1.81	1.86	1.89	2.42	2.80
Apr. 28	.18	.22	.30	.42	.47	.50	.55	.62	.67	.73	.77	.78
May 12	.40	.48	.51	.63	.74	.82	.90	.93	.96	.99	.99	.99
June 5	.20	.29	.49	.54	.67	.73	.77	.83	.92	1.04	1.16	1.24
July 7	.35	.48	.53	.60	.73	.75	.76	.77	.78	.78	.78	.80
July 16	.25	.40	.49	.54	.63	.97	1.16	1.16	1.16	1.16	1.16	1.16
Sept. 3	.17	.24	.39	.49	.50	.53	.54	.54	.54	.54	.54	.54
Nov. 19	.25	.35	.43	.45	.50	.55	.60	.62	.65	.68	.69	.74
<b>OREGON</b>												
Astoria Airport												
Feb. 3	.31	.34	.37	.40	.43	.48	.54	.55	.55	.55	.55	.55
Aug. 24	.22	.30	.38	.46	.60	.66	.70	.82	.91	.91	1.08	1.09
Sept. 30	.20	.30	.40	.43	.45	.46	.46	.46	.46	.46	.48	.57
Burns						None						
Eugene						None						
Meacham						None						
Medford Airport												
Sept. 5	.34	.63	.88	1.12	1.25	1.30	1.30	1.30	1.31	1.32	1.32	1.32
Pendleton						None						
Portland												
June 6	.30	.35	.44	.47	.55	.62	.66	.70	.72	.74	.84	.87
Aug. 23	.25	.28	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
Aug. 23	.25	.30	.33	.34	.34	.35	.35	.35	.35	.35	.35	.35
Roseburg Airport						None						
Sexton Summit												
Aug. 5	.38	.47	.58	.60	.65	.66	.67	.73	.73	.73	.73	.73
<b>PENNSYLVANIA</b>												
Allentown Airport												
May 22-23	.35	.70	1.05	1.40	1.75	2.30	2.53	2.63	2.65	2.89	2.96	2.98
June 7	.30	.38	.41	.43	.46	.46	.46	.46	.46	.46	.46	.46
June 13	.20	.30	.36	.39	.40	.40	.40	.40	.40	.42	.42	.42
June 6	.30	.37	.40	.42	.59	.70	.79	.85	.86	.87	.87	.87
July 21	.31	.60	.69	.72	.76	.77	.77	.80	.80	.80	.80	.80
Aug. 9	.18	.30	.38	.41	.45	.50	.59	.60	.60	.60	.60	.60
Sept. 5	.17	.25	.40	.48	.67	.96	1.02	1.30	1.46	1.57	1.63	1.65
Nov. 23	.22	.37	.40	.44	.50	.55	.60	.62	.65	.67	.68	.70
Harrisburg Airport												
May 17	.25	.39	.45	.69	.76	.76	.76	.80	.80	.80	1.16	1.26
May 26	.23	.33	.41	.52	.61	.70	.74	.89	1.11	1.28	1.44	1.55
June 26	.18	.33	.43	.48	.65	.74	.78	.81	.85	.86	.87	.87
July 6	.22	.32	.37	.40	.41	.42	.56	.71	.72	.72	.72	.72
July 8	.17	.31	.41	.45	.57	.60	.60	.60	.60	.60	.60	.61
Sept. 5	.24	.41	.48	.59	.65	.67	.68	.70	.71	.73	.80	.84
Nov. 23	.18	.34	.45	.51	.58	.60	.65	.67	.68	.70	.70	.71
Philadelphia												
May 17	.24	.34	.42	.47	.49	.49	.50	.50	.50	.50	.50	.50
May 22	.21	.29	.31	.33	.62	.73	.79	.84	.86	.87	.87	.87
May 23	.28	.40	.45	.62	.70	.71	.71	.71	.71	.73	.73	.73
May 26	.16	.24	.31	.46	.52	.56	.58	.58	.59	.59	.59	.59
June 6-7	.38	.51	.56	.70	1.06	1.15	1.19	1.29	1.34	1.35	1.36	1.36
June 13	.23	.46	.59	.67	.73	.91	.98	1.06	1.18	1.31	1.43	1.48
July 19	.36	.36	.38	.42	.42	.42	.42	.42	.42	.42	.42	.42
Aug. 8-9	.26	.43	.43	.43	.43	.43	.43	.43	.43	.43	.43	.43
Pittsburgh												
July 22	.37	.62	.86	.97	1.10	1.56	1.61	1.64	1.67	1.71	1.73	1.75
Aug. 9	.30	.48	.56	.60	.74	.76	.79	.84	.86	.90	.91	.91
Pittsburgh Airport												
Apr. 9	.25	.46	.50	.55	.80	.96	.96	.96	.96	.96	.96	.96
May 7	.18	.26	.38	.42	.42	.42	.43	.43	.43	.43	.43	.43
May 22	.18	.30	.42	.45	.60	.79	.81	.81	.81	.81	.81	.81
June 6	.22	.35	.45	.55	.58	.60	.60	.60	.62	.91	.98	1.00
June 9	.25	.42	.55	.68	.80	.84	.85	.85	.85	.85	.85	.85
June 26	.26	.51	.63	.68	.72	.84	.97	.98	.98	.98	.98	.98
Aug. 9	.40	.65	1.06	1.30	1.48	1.67	1.81	2.00	2.20	2.31	2.36	2.38
Reading												
Apr. 26	.46	.59	.63	.65	.67	.74	.77	.78	.91	.95	.98	.98
May 17	.42	.53	.60	.63	.69	.71	.76	.77	1.26	1.45	1.49	1.50
May 22	.19	.32	.42	.48	.59	.67	.73	.75	.77	.82	.85	.89
May 23	.38	.55	.60	.67	1.01	1.01	1.04	1.34	1.34	1.34	1.36	1.39
May 25	.22	.34	.42	.49	.56	.66	.72	.74	.74	.79	.87	.90
June 28	.33	.40	.42	.44	.49	.50	.52	.52	.52	.52	.52	.52
Scranton												
May 8	.33	.50	.55	.57	.57	.57	.57	.57	.57	.57	.57	.57
June 6	.19	.34	.48	.52	.61	.69	.76	.81	.90	.95	1.03	1.04
June 22	.19	.32	.42	.42	.42	.42	.42	.42	.42	.42	.42	.42
July 2	.25	.38	.51	.54	.59	.73	.86	.97	1.04	1.08	1.13	1.13
Sept. 5	.23	.40	.54	.57	.59	.62	.63	.68	.74	.78	.80	.81
<b>RHODE ISLAND</b>												
Providence Airport												
Aug. 15	.24	.32	.48	.55	.67	.99	1.15	1.27	1.35	1.40	1.59	1.67
Aug. 15	.18	.35	.39	.39	.39	.39	.39	.39	.39	.39	.39	.39
Nov. 23	.29	.47	.56	.65	.92	1.18	1.29	1.35	1.48	1.62	1.73	1.84

Station and date		Maximum precipitation in inches (5 to 180 minutes)											
		5	10	15	20	30	45	60	80	100	120	150	180
SOUTH CAROLINA													
Charleston													
Feb. 7	0.35	0.35	0.36	0.36	0.37	0.38	0.41	0.53	0.59	0.63	0.71	0.83	
June 13	.36	.67	.88	1.17	1.63	2.14	2.55	2.86	2.95	2.95	2.98	2.98	
July 1	.19	.27	.35	.39	.42	.42	.42	.42	.42	.42	.42	.42	
July 20	.25	.40	.44	.44	.44	.44	.44	.44	.44	.44	.44	.44	
July 20	.48	.76	.96	.99	1.02	1.14	1.58	1.66	1.87	1.88	1.88	1.89	
July 22	.20	.29	.39	.53	.68	.70	.74	.76	.77	.78	.78	.78	
July 23	.24	.39	.40	.40	.40	.40	.40	.40	.40	.40	.40	.40	
July 28	.35	.62	.87	1.09	1.18	1.20	1.38	1.43	1.44	1.45	1.45	1.45	
Aug. 4	.16	.26	.37	.50	.69	.76	.77	.78	.79	.83	.90	.94	
Aug. 8	.23	.32	.32	.33	.33	.33	.33	.33	.33	.33	.33	.33	
Aug. 11	.19	.36	.49	.55	.56	.58	.58	.58	.58	.60	.60	.60	
Aug. 17	.23	.38	.48	.54	.65	.81	.88	.92	.96	.96	.96	.96	
Aug. 19	.19	.31	.43	.58	.83	1.07	1.17	1.23	1.28	1.33	1.39	1.40	
Sept. 20	.18	.29	.39	.44	.46	.48	.51	.53	.55	.56	.60	.67	
Dec. 4	.20	.30	.37	.46	.48	.53	.59	.64	.83	1.02	1.03	1.04	
Columbia													
Apr. 30	.26	.38	.45	.45	.67	.74	.82	.85	.88	.90	.91	.96	
May 6	.27	.33	.36	.39	.46	.61	.73	.87	1.08	1.25	1.38	1.45	
June 7	.28	.43	.54	.64	.88	1.06	1.09	1.10	1.11	1.13	1.15	1.16	
July 5	.21	.36	.38	.42	.44	.46	.47	.47	.47	.47	.47	.47	
Aug. 7	.16	.31	.41	.52	.70	.79	.82	.83	.83	.83	.83	.83	
Sept. 5	.27	.54	.59	.61	.62	.62	.63	.63	.63	.64	.68	.71	
Sept. 26-27	.22	.40	.53	.67	.87	1.01	1.35	1.46	1.60	1.83	2.02	2.19	
Sept. 30	.26	.42	.65	.70	.72	.72	.72	.72	.72	.72	.72	.72	
Greenville Airport													
Mar. 14	.37	.45	.45	.45	.45	.45	.45	.45	.45	.45	.45	.45	
July 4	.40	.65	.77	.86	.99	1.44	1.62	1.62	1.62	1.62	1.62	1.62	
July 5	.33	.53	.66	.71	.72	.81	.81	.81	.81	.87	.91	.91	
Aug. 1	.30	.48	.62	.73	.89	1.11	1.18	1.30	1.31	1.32	1.32	1.32	
Aug. 3	.35	.57	.87	1.07	1.40	1.65	1.67	1.67	1.67	1.67	1.67	1.67	
Aug. 7	.38	.63	.67	.69	.69	.72	.73	.74	.76	.77	.78	.78	
Aug. 17	.27	.45	.62	.72	.89	1.11	1.25	1.42	1.49	1.54	1.61	1.62	
Sept. 3	.40	.58	.75	.81	.88	.91	.91	.91	.91	.91	.91	.91	
Sept. 19	.26	.44	.50	.71	.84	1.17	1.36	1.48	1.58	1.65	1.76	1.76	
Spartanburg													
Jan. 8	.15	.28	.38	.48	.52	.60	.77	.89	.94	.98	1.04	1.13	
Apr. 30	.22	.39	.44	.52	.58	.78	.83	.97	1.07	1.10	1.17	1.21	
May 2	.25	.34	.42	.43	.44	.45	.45	.45	.46	.47	.49	.70	
May 19	.20	.28	.42	.42	.43	.43	.44	.48	.52	.54	.55	.57	
June 10	.40	.70	.95	1.20	1.48	1.59	1.61	1.63	1.68	1.71	1.72	1.72	
July 22	.18	.27	.38	.48	.53	.55	.56	.57	.58	.58	.59	.60	
Aug. 17	.29	.35	.44	.45	.46	.46	.47	.47	.47	.47	.47	.47	
SOUTH DAKOTA													
Huron Airport													
June 19	.23	.40	.51	.61	.85	1.09	1.16	1.27	1.31	1.37	1.40	1.41	
June 20	.17	.27	.35	.37	.57	.71	.73	.76	.83	.87	.88	.88	
July 26	.21	.32	.35	.36	.38	.39	.41	.45	.48	.49	.52	.54	
Rapid City Airport													
June 14	.23	.29	.35	.39	.43	.43	.43	.43	.43	.43	.43	.43	
June 15	.33	.40	.40	.40	.40	.40	.40	.40	.40	.40	.40	.40	
June 19	.23	.45	.58	.63	.74	.88	1.07	1.15	1.16	1.17	1.18	1.19	
July 27	.20	.31	.36	.39	.39	.39	.39	.39	.39	.39	.39	.39	
Sioux Falls													
June 17	.85	1.25	1.32	1.34	1.41	1.42	1.75	1.94	1.95	2.50	2.87	2.87	
July 3	.20	.30	.33	.34	.58	.61	.63	.65	.65	.65	.65	.65	
July 5	.25	.28	.30	.32	.32	.32	.32	.32	.32	.32	.34	.34	
July 2	.29	.52	.75	.89	.90	.90	.90	.90	.90	.90	.90	.90	
Aug. 5	.43	.62	.80	.86	1.05	1.40	1.50	1.51	1.60	1.60	1.60	1.65	
Aug. 10	.25	.50	.53	.55	.57	.59	.61	.63	.65	.66	.75	.75	
TENNESSEE													
Bristol Airport													
May 6	.11	.18	.28	.38	.53	.57	.59	.60	.62	.65	.78	.86	
May 13	.20	.30	.50	.60	.65	.72	.75	.76	.76	.82	.83	.88	
May 10	.33	.38	.43	.43	.43	.43	.43	.43	.43	.63	.63	.63	
June 28	.40	.70	.95	1.20	1.32	1.37	1.37	1.38	1.40	1.40	1.40	1.40	
July 2	.18	.33	.34	.35	.40	.42	.42	.42	.43	.44	.47	.47	
July 7	.23	.34	.40	.49	.58	.60	.63	.67	.72	.75	.78	.80	
July 22	.30	.57	.59	.70	.71	.74	.74	.75	.75	.75	.75	.75	
May 11	.24	.34	.37	.50	.51	.64	.65	.65	.65	.65	.65	.65	
Sept. 5	.24	.40	.50	.55	.58	.61	.62	.63	.64	.65	.73	.90	
Chattanooga AP													
Feb. 20	.18	.32	.41	.49	.56	.62	.69	.78	.84	.90	.92	.94	
Apr. 12	.18	.35	.43	.48	.52	.59	.66	.74	.84	.95	1.11	1.25	
Apr. 30	.31	.54	.60	.65	.69	.88	1.00	1.07	1.13	1.20	1.36	1.57	
July 4	.27	.40	.40	.40	.40	.40	.40	.40	.40	.40	.40	.40	
July 18	.16	.24	.34	.40	.51	.59	.67	.68	.67	.67	.92	.92	
Aug. 8	.39	.67	.77	.87	.87	1.02	1.03	1.03	1.03	1.10	1.43	1.44	
Aug. 16	.36	.54	.72	.76	.76	.79	.80	.82	.82	.82	.82	.82	
Knoxville Airport													
Mar. 4	.16	.30	.33	.37	.48	.63	.73	.83	.85	1.04	1.13	1.30	
Apr. 10	.25	.35	.42	.52	.54	.67	.70	.74	.74	.74	.74	.74	
Apr. 12	.29	.37	.43	.44	.44	.44	.44	.44	.44	.44	.44	.45	
May 9	.39	.43	.43	.45	.53	.67	.67	.67	.67	.67	.67	.67	
May 18	.20	.30	.33	.35	.38	.41	.45	.50	.55	.55	.56	.57	
July 24	.25	.42	.50	.60	.60	.60	.60	.60	.60	.60	.60	.60	
July 8	.28	.40	.50	.60	.65	.75	.97	1.00	1.00	1.00	1.00	1.00	
July 18	.23	.34	.37	.40	.40	.40	.40	.40	.40	.40	.40	.40	
Memphis Airport													
Jan. 7-8	.17	.30	.36	.45	.49	.54	.58	.58	.63	.68	.71	.73	
Mar. 2	.17	.30	.37	.40	.43	.47	.53	.62	.67	.70	.81	.86	
Mar. 14	.27	.45	.60	.62	.64	.66	.67	.70	.71	.71	.71	.71	
Mar. 17-18	.27	.29	.31	.32	.37	.42	.44	.48	.51	.52	.54	.55	
Mar. 22	.23	.31	.38	.42	.49	.57	.81	1.05	1.16	1.22	1.32	1.33	
Mar. 22	.22	.38	.49	.66	.81	.98	1.08	1.17	1.25	1.32	1.43	1.47	
Mar. 31	.22	.44	.58	.60	.62	.62	.62	.62	.63	.64	.64	.64	
Apr. 18	.27	.30	.31	.32	.34	.37	.38	.38	.38	.38	.38	.38	
Apr. 24	.20	.39	.49	.55	.62	.66	.68	.73	.77	.81	.87	.87	
Apr. 29	.24	.40	.62	.71	.96	1.17	1.30	1.68	1.80	2.00	2.00	2.00	
May 11	.55	.73	.81	.84	.89	.93	.97	1.00	1.05	1.11	1.15	1.19	
May 12	.38	.55	.61	.63	.66	.68	.69	.69	.69	.69	.69	.69	
May 14	.13	.24	.35	.42	.54	.66	.76	.81	.85	.89	.93	.95	
May 22	.36	.54	.61	.68	.73	.80	.86	.93	.98	1.00	1.02	1.05	



## EXCESSIVE SHORT DURATION RAINFALL

Table 8-Continued

YEAR 1953

Station and date		Maximum precipitation in inches (5 to 180 minutes)											
		5	10	15	20	30	45	60	80	100	120	150	180
TENNESSEE (Cont'd.)													
Memphis AP (Cont'd.)													
July 21		0.31	0.55	0.77	0.87	0.98	1.13	1.35	1.72	1.98	1.94	2.04	2.04
Oct. 26		.18	.28	.42	.49	.69	.86	1.03	1.18	1.27	1.32	1.38	1.47
Nov. 21-22		.32	.45	.53	.70	1.03	1.34	1.51	1.79	1.90	1.98	2.12	2.17
Dec. 5		.26	.49	.60	.85	1.17	1.37	1.43	1.56	1.60	1.62	1.64	1.66
Nashville Airport													
May 16		.40	.55	.63	.63	.63	.63	.63	.63	.63	.63	.63	.63
May 19		.15	.25	.40	.44	.52	.60	.75	.80	.82	.83	.97	1.02
July 6		.46	.70	.80	.86	.81	.81	.81	.81	.81	.81	.81	.81
July 7		.43	.71	.76	.80	.89	1.13	1.47	1.60	1.68	1.68	1.68	1.68
July 16		.33	.35	.40	.69	.72	.75	.77	.77	.79	.83	.85	.89
Aug. 8		.40	.55	.57	.57	.58	.58	.72	.85	.85	.85	.85	.86
TEXAS													
Abilene													
Apr. 5		.31	.45	.46	.47	.48	.48	.48	.48	.48	.49	.53	.53
May 12		.27	.51	.66	.75	.90	.95	1.00	1.06	1.10	1.10	1.10	1.10
June 30		.35	.67	.97	1.09	1.39	1.53	1.69	1.82	1.94	1.99	2.12	2.18
July 15		.30	.42	.52	.59	.67	.67	.67	.67	.67	.70	.76	.82
July 17		.14	.27	.41	.52	.75	.82	.87	1.01	1.08	1.13	1.35	1.57
Amarillo Airport													
Oct. 20		.17	.30	.33	.34	.47	.69	.80	.85	.88	1.01	1.08	1.18
Oct. 22		.19	.37	.38	.39	.50	.62	.69	.75	.79	.85	1.00	1.11
Austin Airport													
Mar. 11		.41	.52	.54	.54	.54	.54	.54	.54	.54	.54	.54	.54
Mar. 31		.26	.41	.44	.45	.47	.50	.52	.52	.52	.52	.52	.52
Apr. 29		.24	.38	.46	.63	.79	1.00	1.23	1.39	1.89	2.09	2.11	2.20
June 29		.28	.43	.57	.63	.65	1.03	1.09	1.09	1.09	1.10	1.11	1.16
Aug. 27		.21	.37	.55	.68	.76	.78	.79	.79	.79	.79	.79	.79
Sept. 3		.18	.32	.44	.53	.61	.68	.76	.84	.94	1.06	1.21	1.28
Oct. 23		.43	.75	1.12	1.45	2.16	2.71	3.05	3.21	3.27	3.47	3.66	3.68
Oct. 25		.26	.44	.58	.66	.76	.80	.82	.83	.86	.92	.96	1.00
Dec. 1		.22	.31	.44	.49	.68	.99	1.10	1.18	1.28	1.36	1.43	1.58
Brownsville Airport													
Aug. 24		Record not available					1.07	1.07	1.07	1.07	1.07	1.07	1.07
Corpus Christi													
May 14		.21	.29	.42	.48	.49	.49	.49	.49	.49	.49	.49	.51
Aug. 21		.28	.46	.57	.66	.85	.87	1.11	1.20	1.20	1.20	1.20	1.20
Aug. 25		.25	.45	.61	.72	.97	1.37	1.49	1.54	1.56	1.60	1.68	1.70
Aug. 26		.22	.39	.48	.49	.51	.55	.64	.71	.76	.80	.86	.87
Aug. 28		.31	.51	.71	.89	.98	1.36	1.54	1.64	1.74	1.78	2.34	2.46
Aug. 28		.40	.68	.78	.81	.88	.96	1.04	1.12	1.30	1.44	1.66	1.73
Aug. 29		.22	.43	.53	.59	.72	.82	.89	.89	.93	.94	.94	.96
Aug. 30		.25	.42	.53	.59	.72	.86	.99	1.00	1.01	1.01	1.01	1.01
Sept. 1		.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25
Oct. 23		.24	.43	.46	.47	.71	.87	1.06	1.35	1.49	1.54	1.66	1.71
Oct. 26		.29	.50	.79	.99	1.25	1.49	1.55	1.57	1.57	1.57	1.57	1.57
Dallas Airport													
Mar. 22		.17	.29	.39	.50	.64	.65	.66	.66	.66	.66	.66	.66
Apr. 23		.22	.33	.45	.52	.64	1.05	1.32	1.38	1.40	1.40	1.40	1.40
Apr. 28		.25	.32	.42	.60	.70	.72	.74	.77	.82	.87	.87	1.09
Apr. 28		.32	.54	.61	.62	.63	.77	.77	.79	.83	.85	.86	1.14
May 16		.20	.30	.32	.32	.33	.35	.35	.35	.35	.35	.35	.35
Aug. 31		.27	.42	.46	.73	.80	.89	.82	.82	.82	.82	.82	.85
Oct. 23		.20	.23	.30	.40	.48	.72	.85	.97	1.13	1.20	1.30	1.39
Oct. 25		.17	.30	.45	.58	.65	.78	.90	.97	1.08	1.18	1.27	1.33
Del Rio Airport													
Sept. 1		.21	.37	.49	.62	.91	1.17	1.25	1.40	1.45	1.70	1.93	2.35
Oct. 4		.22	.39	.53	.71	.99	1.25	1.36	1.45	1.51	1.52	1.52	1.53
El Paso Airport							None						
Fort Worth													
Apr. 23		.18	.34	.45	.60	.79	1.26	1.31	1.37	1.38	1.38	1.45	1.46
Apr. 28		.30	.42	.66	.78	.89	1.00	1.04	1.06	1.09	1.12	1.12	1.44
Apr. 28		.20	.33	.38	.38	.41	.49	.51	.54	.57	.59	.59	.59
May 10		.20	.25	.40	.45	.50	.52	.53	.53	.53	.53	.53	.53
May 12		.17	.30	.33	.36	.38	.42	.46	.52	.55	.57	.57	.66
Fort Worth AP*													
Feb. 8		.25	.30	.31	.33	.33	.33	.34	.34	.34	.34	.34	.34
Apr. 30		.25	.28	.28	.28	.28	.28	.28	.28	.28	.29	.35	.36
Apr. 30		.35	.61	.85	1.02	1.32	1.69	1.98	2.03	2.14	2.18	2.20	2.20
Apr. 28		.17	.30	.36	.51	.75	.96	1.05	1.10	1.10	1.10	1.10	1.17
May 15		.48	.59	.64	.70	.84	.87	.88	.89	1.26	1.35	----	----
Sept. 3		.33	.45	.55	.69	.97	1.20	1.35	1.40	1.41	1.41	1.41	1.41
Oct. 23		.25	.32	.43	.52	.70	1.30	1.10	1.23	1.39	1.45	1.49	1.55
Oct. 25		.14	.22	.28	.36	.56	.63	.76	.93	1.13	1.24	1.45	1.53
Galveston													
Jan. 31		.31	.56	.71	.82	.91	.95	1.00	1.03	1.06	1.11	1.16	1.18
Apr. 6		.28	.38	.40	.44	.48	.48	.48	.48	.48	.48	.48	.48
May 4		.12	.22	.31	.41	.56	.69	.73	.74	.74	.75	.76	.79
May 13		.14	.25	.35	.44	.53	.61	.64	.67	.69	.70	.73	.74
May 15		.37	.57	.79	.95	1.05	1.25	1.60	1.82	1.84	1.85	1.86	1.87
May 18		.33	.56	.87	1.14	1.32	1.40	1.41	1.44	1.46	1.47	1.48	1.49
June 29		.32	.62	.76	.85	.97	1.31	1.53	1.73	1.77	1.78	1.78	1.89
July 28		.28	.40	.48	.53	.60	.65	.82	.82	.82	.82	.82	.85
Aug. 18		.20	.39	.52	.63	.68	.73	.78	.78	.93	.83	.83	.83
Aug. 20		.22	.36	.47	.64	.76	.94	1.06	1.17	1.24	1.26	1.27	1.27
Aug. 26		.41	.73	.93	1.29	1.70	1.84	1.88	1.95	1.99	1.99	1.99	1.99
Aug. 29		.26	.47	.68	.85	1.20	1.59	1.79	2.08	2.26	2.41	2.73	3.10
Aug. 30		.28	.43	.51	.62	.71	1.06	1.26	1.31	1.33	1.33	1.33	1.34
Aug. 31		.21	.30	.39	.51	.51	.71	.81	.94	1.07	1.07	1.25	1.39
Oct. 25		.34	.47	.53	.54	.59	.59	.63	.63	.63	.63	.63	.64
Nov. 2		.21	.34	.48	.61	.70	.78	.85	.89	.89	.90	.90	.90
Nov. 3		.27	.47	.56	.65	.94	1.19	1.34	1.37	1.37	1.37	1.37	1.38
Houston													
Jan. 31		.30	.47	.60	.71	.87	.94	.98	1.04	1.09	1.15	1.30	1.37
Feb. 20		.18	.25	.40	.44	.55	.58	.60	.61	.62	.63	.64	.67
Apr. 29		.33	.47	.53	.59	.81	.90	.96	.97	.98	.99	.99	1.01
May 3		.31	.45	.47	.48	.50	.50	.50	.51	.51	.56	.56	.57
May 4		.25	.35	.45	.55	.61	.68	.79	.97	1.23	1.31	1.47	1.57
May 12		.19	.35	.46	.59	.71	.93	1.07	1.44	1.62	1.73	1.87	1.92
May 18		.38	.72	1.00	1.18	1.52	1.74	1.89	1.96	2.00	2.03	2.04	2.20
June 29		.19	.33	.45	.50	.57	.92	1.05	1.10	1.13	1.21	1.44	1.52

Station and date		Maximum precipitation in inches (5 to 180 minutes)											
		5	10	15	20	30	45	60	80	100	120	150	180
TEXAS (Cont'd.)													
Houston (Cont'd.)													
Aug. 19	0.22	0.34	0.36	0.39	0.57	0.75	0.80	1.16	1.30	1.31	1.32	1.32	
Aug. 29	.14	.24	.30	.35	.50	.67	.80	.86	.94	1.06	1.10	1.22	
Oct. 26	.25	.44	.63	.75	.89	.98	1.01	1.07	1.16	1.27	1.36	1.37	
Nov. 18	.43	.46	.48	.69	.96	1.32	1.46	1.83	2.13	2.62	2.73	2.81	
Dec. 3	.32	.45	.49	.52	.53	.56	.56	.59	.59	.60	.61	.61	
Laredo Airport													
Apr.	.15	.30	.45	.48	.48	.48	.48	.48	.48	.48	.48	.49	
May 18	.23	.36	.38	.41	.42	.42	.42	.42	.42	.42	.42	.42	
Aug. 23	.60	1.06	1.50	1.89	2.54	3.34	4.00	4.21	4.30	4.33	4.38	4.39	
Sept. 4	.35	.52	.77	.97	1.16	1.43	1.69	1.76	1.87	1.92	2.03	2.11	
Port Arthur AP													
May 12	.33	.52	.61	.65	.75	.93	1.23	1.40	1.54	1.71	1.86	1.93	
May 18	.25	.36	.50	.53	.57	.77	.85	1.12	1.32	1.39	1.64	1.93	
June 29	.32	.52	.55	.56	.58	.64	.78	.88	1.24	1.26	1.26	1.26	
July 30	.21	.30	.47	.56	.64	.68	.69	.69	.69	.69	.69	.69	
July 31	.26	.42	.57	.70	1.06	1.21	1.22	1.22	1.22	1.23	1.23	1.23	
Aug. 21	.35	.57	.82	1.11	1.56	1.60	1.61	1.61	1.61	1.61	1.61	1.61	
Aug. 29	.31	.45	.54	.72	.85	.92	1.26	1.37	1.43	1.84	2.08	2.28	
Aug. 30	.22	.42	.47	.48	.50	.63	.63	.67	.68	.69	.69	.71	
Aug. 30	.21	.40	.48	.60	.77	.95	.98	1.01	1.06	1.12	1.16	1.22	
Oct. 26	.17	.30	.42	.44	.49	.54	.57	.60	.63	.65	.67	.67	
Nov. 21	.25	.43	.55	.63	.73	.75	.76	.76	.76	.76	.76	.76	
Dec. 3	.23	.43	.47	.52	.56	.60	.79	.99	1.05	1.27	1.43	1.47	
San Angelo Airport													
Mar. 8	.20	.40	.56	.62	.85	1.06	1.60	1.70	1.88	2.00	2.18	2.30	
May 12	.20	.25	.32	.50	.70	.76	1.01	1.15	1.19	1.28	1.28	1.28	
July 13	.22	.40	.52	.57	.74	.91	.82	.85	.85	.85	.86	.87	
July 15	.35	.60	.80	1.07	1.46	1.87	2.02	2.05	2.07	2.07	2.07	2.07	
Sept. 3	.50	.67	.75	.80	.81	.95	.86	.86	.86	.87	.87	.87	
Oct. 3	.22	.35	.42	.47	.65	.80	1.00	1.01	1.16	1.17	1.22	1.22	
Oct. 23	.24	.42	.62	.68	.83	.85	.93	.94	.95	.95	.95	.95	
San Antonio													
May 14	.20	.32	.37	.39	.44	.46	.47	.48	.48	.48	.48	.48	
June 29	.33	.51	.70	.88	1.08	1.38	1.42	1.44	1.46	1.48	1.51	1.59	
Aug. 24	.12	.20	.30	.38	.52	.73	.81	.87	.97	1.05	1.13	1.30	
Sept. 4	.13	.20	.32	.42	.51	.68	.72	.84	.99	1.07	1.14	1.21	
Oct. 25	.23	.36	.43	.44	.52	.56	.57	.57	.57	.57	.57	.57	
Victoria													
Apr. 2	.30	.58	.75	.87	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	
May 3	.20	.33	.38	.42	.45	.46	.46	.46	.46	.46	.46	.46	
May 3	.25	.33	.40	.50	.60	.68	.68	.68	.68	.68	.68	.68	
May 18	.30	.40	.65	.78	.83	1.00	1.08	1.17	1.35	1.44	1.45	1.46	
May 24	.20	.35	.36	.40	.41	.44	.44	.44	.45	.66	.68	.70	
Aug. 30	.32	.44	.67	.78	.80	.83	.83	.98	1.07	1.18	1.29	1.29	
Aug. 30	.21	.28	.29	.45	.58	.70	.82	1.15	1.35	1.40	1.75	1.80	
Oct. 26	.45	.58	.64	.69	.74	.78	.80	.83	.84	.85	.85	.85	
Oct. 31	.35	.66	.82	.87	.90	.91	.92	1.00	1.00	1.00	1.00	1.00	
Waco													
Feb. 10	.20	.40	.60	.63	.67	.72	.72	.72	.72	.73	.74	.75	
Apr. 23	.20	.40	.55	.58	.65	.68	.70	.71	.72	.73	.73	.73	
Apr. 24	.20	.30	.42	.55	.72	.87	.91	.91	.92	.93	.93	.93	
May 11	.40	.59	.68	.69	.71	.96	1.21	1.24	1.24	1.24	1.24	1.24	
May 11	.32	.62	.87	1.12	1.37	1.42	1.43	1.43	1.43	1.43	1.43	1.43	
May 12	.35	.68	.92	1.08	1.16	1.23	1.29	1.42	1.71	2.04	2.56	2.92	
May 15	.25	.46	.55	.58	.60	.61	.65	.66	.67	.70	.72	.72	
July 23	.20	.33	.40	.45	.55	.66	.77	.77	.77	.77	.77	.77	
Aug. 2	.47	.77	.94	1.13	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	
Aug. 30	.25	.45	.60	.70	.82	.83	.83	.83	.83	.83	.83	.83	
Sept. 1	.17	.32	.47	.57	.72	.79	.88	.89	.90	.90	.90	.90	
Wichita Falls													
Apr. 5	.22	.30	.31	.31	.31	.31	.31	.31	.31	.31	.40	.51	
May 11	.28	.30	.40	.50	.55	.66	.73	.73	.74	.74	.74	.74	
June 6	.45	.65	.65	.65	.65	.65	.65	.65	.65	.65	.65	.65	
Aug. 24	.25	.40	.46	.55	.75	.95	.99	.99	.99	.99	.99	.99	
Oct. 22	.27	.29	.35	.41	.58	.77	.84	.97	1.11	1.16	1.31	1.45	
Oct. 25	.23	.33	.44	.50	.75	.95	1.12	1.20	1.32	1.40	1.47	1.50	
Nov. 18	.30	.55	.60	.60	.60	.60	.60	.60	.60	.60	.60	.60	
UTAH													
Milford													
July 15	.25	.41	.53	.61	.61	.61	.61	.61	.62	.63	.63	.63	
Salt Lake City													
None													
VERMONT													
Burlington Airport													
Aug. 25	.48	.67	.68	.68	.69	.70	.70	.70	.70	.70	.76	.76	
Aug. 28	.22	.29	.40	.41	.62	.70	.74	.79	.80	.80	.80	.80	
VIRGINIA													
Cape Henry													
Apr. 12	.28	.47	.55	.61	.64	.70	.70	.79	.85	.99	1.20	1.26	
Apr. 30	.25	.37	.50	.65	.86	.93	1.34	1.38	1.60	1.77	2.02	2.17	
May 6	.31	.59	.57	.62	.67	.68	.69	.69	.69	.69	.69	.69	
May 18	.46	.69	.80	.86	.97	1.04	1.05	1.09	1.10	1.10	1.10	1.10	
June 13	.28	.41	.48	.53	.62	1.03	1.06	1.07	1.08	1.08	1.09	1.10	
July 19	.30	.51	.63	.68	.72	.73	.84	.86	.87	.90	.90	.90	
July 31	.23	.41	.59	.68	.73	.79	.81	.82	.82	.82	.82	.82	
Aug. 14	.11	.21	.20	.39	.53	.74	.85	1.04	1.36	1.56	1.73	1.89	
Aug. 17	.31	.58	.84	1.05	1.27	1.36	1.45	1.51	1.57	1.64	1.68	1.71	
Sept. 4	.25	.45	.54	.70	.75	.98	1.01	1.02	1.02	1.02	1.02	1.02	
Sept. 4	.34	.49	.71	.84	1.35	1.85	2.12	2.71	2.77	2.80	2.85	3.55	
Sept. 12	.34	.53	.58	.58	.59	.61	.61	.61	.61	.61	.64	.65	
Lynchburg													
May 9	.34	.52	.66	.69	.71	.73	.75	.76	.77	.79	.82	.83	
June 6	.14	.22	.36	.38	.39	.39	.46	.60	.71	.75	.78	.78	
June 7	.15	.28	.38	.45	.51	.55	.57	.61	.61	.66	.68	.71	
June 21	.27	.45	.57	.73	.90	1.07	1.10	1.11	1.11	1.11	1.11	1.11	
July 5	.18	.26	.44	.48	.58	.64	.67	.70	.73	.73	.76	.76	
Aug. 1	.22	.36	.54	.66	.68	.68	1.23	1.27	1.27	1.27	1.27	1.27	
Aug. 8	.71	.94	.95	.95	.96	.97	.97	.99	1.00	1.00	1.00	1.00	
Sept. 12	.51	.53	.57	.63	.82	1.13	1.42	1.75	1.94	2.25	2.26	2.26	
Oct. 27	.44	.57	.77	.96	.98	1.05	1.22	1.27	1.38	1.41	1.41	1.41	

\* The WB recording rain gage was moved from Meacham Field to Amon Carter Field effective May 1, 1955.

# EXCESSIVE SHORT DURATION RAINFALL

Table 8-Continued

YEAR 1953

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
VIRGINIA (Cont'd.)												
Norfolk												
Apr. 10	0.45	0.65	0.81	0.93	0.99	1.03	1.03	1.03	1.03	1.03	1.03	1.03
Apr. 30	.38	.56	.63	.67	.97	1.11	1.22	1.65	1.70	2.11	2.43	2.50
May 18	.69	1.24	1.79	2.20	2.46	2.51	2.72	2.78	2.83	2.84	2.84	2.85
June 17	.26	.44	.54	.67	.82	.93	.99	1.05	1.08	1.10	1.31	1.38
June 27	.38	.56	.78	.89	1.09	1.31	1.89	2.18	2.44	2.62	2.66	2.66
July 3	.27	.37	.37	.38	.38	.38	.38	.46	.69	.71	.71	.71
July 8	.28	.47	.53	.73	.90	1.04	1.04	1.04	1.04	1.04	1.04	1.04
*Aug. 17	.45	.62	(.80)	(.98)	(1.40)	(1.71)	1.73	(1.79)	(1.86)	1.91	(1.92)	1.93
Richmond Airport												
Jan. 24	.39	.42	.43	.43	.45	.52	.57	.68	.82	.90	1.11	1.20
Feb. 15	.20	.31	.36	.37	.46	.66	.73	.80	.86	.90	.99	1.03
May 15	.33	.47	.47	.47	.47	.47	.47	.47	.47	.47	.47	.47
May 31	.25	.36	.38	.40	.42	.45	.46	.46	.46	.46	.46	.46
June 9	.29	.53	.60	.98	1.36	1.42	1.43	1.43	1.43	1.43	1.43	1.43
June 17	.12	.22	.32	.42	.51	.61	.67	.70	.71	.72	.73	.73
July 22	.25	.34	.36	.38	.40	.42	.43	.43	.43	.43	.43	.43
Sept. 5	.32	.55	.67	.88	1.24	1.43	1.90	2.23	2.33	2.43	2.50	2.63
Sept. 12	.28	.48	.62	.75	.85	.89	.91	.93	1.03	1.43	1.49	1.58
Nov. 23	.32	.41	.43	.45	.46	.48	.49	.49	.49	.49	.49	.49
Roanoke Airport												
May 6	.55	.85	1.10	1.13	1.20	1.40	1.43	1.44	1.44	1.44	1.44	1.44
May 19	.10	.20	.30	.39	.52	.57	.60	.67	.68	.69	.70	.74
June 17	.25	.40	.60	.78	.82	.87	.93	.98	.98	.99	.99	1.00
June 27	.30	.45	.55	.60	.60	.60	.63	.65	.69	.70	.70	.70
Aug. 8	.17	.33	.46	.65	.70	.75	.85	1.10	1.10	1.15	1.15	1.15
WASHINGTON												
Seattle							None					
Spokane							None					
Tatoosh Island							None					
Walla Walla							None					
Yakima Airport							None					
WEST VIRGINIA												
Charleston Airport												
Mar. 23	.17	.28	.37	.53	.62	.66	.67	.67	.67	.67	.67	.67
May 31	.58	.58	.58	.58	.58	.58	.58	.58	.58	.58	.58	.58
June 10	.30	.45	.46	.48	.50	.52	.56	.63	.67	.70	.71	.74
July 2	.44	.47	.49	.49	.49	.49	.49	.49	.49	.49	.49	.49
July 6	.30	.35	.63	.70	.74	.77	.80	.87	.94	1.15	1.15	1.15
Aug. 3	.35	.45	.48	.49	.49	.49	.49	.49	.49	.49	.49	.49
Aug. 8	.30	.53	.58	.58	.58	.58	.58	.63	.63	.63	.63	.63
Dec. 4	.27	.28	.29	.32	.32	.34	.36	.37	.37	.37	.37	.37
Elkins Airport												
May 23	.28	.35	.44	.47	.50	.53	.55	.55	.55	.55	.55	.55
June 26	.37	.51	.55	.55	.56	.56	.56	.56	.57	.57	.57	.57
June 28	.21	.35	.50	.56	.83	.95	1.12	1.42	1.46	1.52	1.56	1.57
July 8	.27	.42	.47	.50	.57	.61	.63	.63	.63	.63	.63	.63
Aug. 1	.30	.38	.41	.42	.42	.42	.42	.61	.61	.61	.61	.61
Aug. 3	.15	.22	.30	.40	.47	.48	.49	.50	.50	.50	.50	.50
Huntington												
June 10	.35	.37	.39	.40	.41	.42	.43	.47	.51	.55	.63	.70
June 12	.36	.48	.49	.49	.50	.50	.50	.50	.50	.50	.50	.50
July 6	.30	.42	.50	.52	.63	.85	.99	1.45	1.53	1.72	1.95	2.01
July 22	.21	.28	.43	.47	.53	.64	.68	.69	.71	.71	.71	.71
Aug. 8	.28	.34	.38	.39	.40	.40	.43	.44	.50	.50	.50	.50
Parkersburg												
June 9	.35	.43	.45	.46	.47	.47	.48	.48	.48	.48	.48	.48
June 12	.25	.50	.60	.60	.60	.60	.65	.65	.65	.65	.65	.65
June 21	.35	.46	.55	.65	.72	.77	.80	.80	.80	.80	.80	.80
July 2	.35	.40	.45	.48	.63	.68	.83	.88	.88	.88	.88	.88
Aug. 4	.25	.35	.40	.42	.50	.52	.55	.55	.55	.55	.55	.58
Aug. 9	.30	.35	.38	.39	.40	.40	.40	.40	.40	.40	.40	.40
Sept. 5	.15	.30	.45	.47	.50	.54	.56	.56	.56	.56	.57	.58
Petersburg												
June 7	.24	.45	.50	.52	.52	.65	.76	.76	.79	.79	.79	.79
June 9	.20	.39	.39	.39	.41	.41	.41	.41	.41	.41	.41	.41
June 27	.25	.35	.40	.45	.51	.51	.51	.51	.52	.53	.53	.54
July 19	.20	.33	.38	.41	.43	.43	.43	.43	.43	.43	.43	.43
Aug. 4	.31	.56	.58	.58	.58	.58	.58	.58	.58	.58	.58	.58
Oct. 28	.25	.27	.35	.36	.40	.44	.45	.46	.62	.65	.65	.65
Nov. 22	.25	.50	.65	.68	.73	.75	.77	.80	.95	.95	1.00	1.00
WISCONSIN												
Green Bay Airport												
July 28	.21	.34	.40	.43	.46	.47	.64	.71	.71	.71	.73	.73
Sept. 6	.21	.34	.40	.43	.44	.46	.56	.80	.84	.85	.95	1.31
Sept. 6	.26	.32	.35	.36	.36	.36	.36	.36	.36	.36	.36	.36
La Crosse												
June 4	.27	.43	.52	.59	.62	.62	.62	.62	.63	.84	.84	.84
June 13	.40	.62	.63	.63	.64	.64	.64	.65	.70	.72	.79	.80
July 4	.24	.29	.38	.43	.72	.85	.95	1.02	1.16	1.18	1.19	1.19
July 12	.16	.24	.30	.38	.48	.65	.87	1.11	1.26	1.34	1.51	1.54
July 21	.17	.30	.39	.49	.52	.54	.54	.54	.54	.54	.54	.54
Aug. 6	.23	.39	.45	.49	.54	.54	.54	.54	.54	.54	.54	.54
Madison												
June 4	.35	.49	.66	.91	1.15	1.49	1.62	1.70	1.82	1.89	2.02	2.10
July 5	.29	.35	.53	.60	.67	.70	.72	.80	.83	.84	.84	.84
July 21	.38	.63	.87	1.02	1.20	1.56	1.75	2.49	2.50	2.50	2.50	2.50
Aug. 4	.39	.61	.70	.80	.84	.93	1.03	1.13	1.18	1.19	1.19	1.19
Milwaukee												
May 21	.33	.40	.44	.44	.45	.49	.49	.49	.49	.49	.49	.49
June 4	.33	.39	.48	.50	.55	.58	.65	.75	.78	.81	.83	.86
June 5	.30	.45	.50	.54	.57	.64	.68	.68	.68	.68	.68	.68
July 20	.20	.30	.45	.50	.55	.55	.56	.56	.58	.58	.61	.61
Aug. 1	.20	.35	.45	.55	.65	.70	.70	.90	.92	.92	.95	1.04
Aug. 4	.40	.55	.58	.60	.65	.70	.72	.75	.75	.75	.75	.75

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
WYOMING												
Casper Airport												
July 15	0.19	0.32	0.41	0.46	0.66	0.79	0.81	0.84	0.84	0.84	0.84	0.84
Aug. 2	.14	.23	.36	.48	.59	.64	.65	.67	.67	.67	.67	.67
Cheyenne Airport												
June 6	.24	.48	.73	.94	.99	.99	1.00	1.09	1.24	1.26	1.26	1.26
July 15	.29	.52	.63	.72	.79	.87	.93	.98	.99	.99	.99	.99
Lander Airport												
Rock Springs AP												
Aug. 8	.25	.27	.28	.28	.28	.28	.28	.28	.28	.28	.28	.28
Sheridan Airport						None						
ALASKA												
Anchorage Airport						None						
Annette Airport	None - for period Jan. 1 to May 1953											
Fairbanks Airport						None						
Juneau						None						
Yakutat Airport						None						
PUERTO RICO												
Santa Isabel AP												
June 23	.12	.22	.30	.41	.60	.66	.67	.68	.84	.86	.88	.88
July 8	.33	.65	.85	.91	1.30	1.42	1.57	1.61	1.66	1.68	1.70	1.71
Aug. 8	.26	.47	.53	.64	.72	1.03	1.35	1.62	1.91	2.22	2.76	2.94
Sept. 8	.36	.68	.97	1.06	1.36	1.67	1.79	2.02	2.16	2.27	2.32	2.36
Sept. 15	.28	.35	.41	.41	.41	.41	.41	.41	.41	.41	.41	.41
Sept. 15	.32	.53	.76	1.11	1.35	1.45	1.47	1.51	1.59	1.63	2.07	2.19
Oct. 7	.21	.37	.42	.52	.64	.69	.70	.70	.70	.70	.70	.70
Oct. 24	.22	.36	.43	.44	.48	.48	.48	.54	.61	.73	.83	.98
San Juan												
Mar. 31	.34	.50	.57	.80	.92	.93	1.12	1.33	1.34	1.36	1.36	1.38
Apr. 19	.24	.45	.63	.79	.98	1.17	1.20	1.23	1.32	1.36	1.44	1.49
May 13	.32	.53	.65	.66	.68	.69	.70	.71	.71	.72	.72	.73
May 19-20	.50	.85	1.00	1.25	1.35	1.90	2.50	2.58	3.10	3.42	3.50	3.68
May 21	.29	.38	.39	.39	.45	.86	.90	1.06	1.08	1.12	1.29	1.36
June 18	.35	.53	.55	.57	.63	.73	.74	.75	.76	.76	.78	.84
Aug. 14	.25	.26	.26	.26	.26	.26	.26	.26	.26	.26	.26	.26
Aug. 18	.50	.50	.65	.75	1.00	1.13	1.13	1.13	1.13	1.14	1.14	1.14
Aug. 25	.30	.45	.48	.53	.54	.54	.54	.57	.57	.58	.62	1.10
Sept. 19	.30	.37	.37	.37	.42	.42	.42	.47	.47	.47	.56	.56
Sept. 28	.25	.40	.42	.44	.45	.46	.46	.46	.46	.46	.46	.46
Nov. 16	.22	.37	.42	.46	.51	.57	.57	.57	.58	.67	.80	.80
Nov. 17	.25	.30	.33	.37	.55	.75	.92	1.05	1.10	1.12	1.15	1.17
Nov. 30	.22	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25
San Juan Airport												
Mar. 31	.34	.47	.66	.76	.86	1.05	1.07	1.26	1.31	1.32	1.32	1.32
Apr. 19	.25	.41	.63	.76	1.10	1.26	1.45	1.55	1.73	1.93	1.95	1.95
May 13	.23	.36	.43	.51	.55	.55	.56	.57	.57	.58	.60	.60
May 26	.28	.39	.42	.44	.44	.44	.44	.44	.44	.44	.60	.71
June 8	.22	.32	.36	.36	.36	.36	.36	.36	.36	.37	.37	.37
June 12	---	---	---	---	.59	.59	.59	.59	.59	.59	.59	.59
June 13	.29	.48	.65	.76	1.04	1.30	1.31	1.56	1.57	1.57	1.57	1.65
June 18	.23	.37	.38	.38	.38	.38	.38	.48	.49	.49	.49	.49
June 25	.27	.43	.43	.43	.46	.49	.49	.49	.49	.49	.49	.49
June 27	.28	.28	.29	.29	.30	.30	.30	.30	.30	.30	.30	.30
July 11	.22	.36	.45	.49	.51	.54	.54	.54	.54	.54	.54	.54
Aug. 8	.17	.26	.37	.52	.61	.70	.77	.79	.80	.82	.83	.84
Aug. 25	.17	.25	.37	.45	.45	.45	.46	.46	.46	.46	.46	.48
Aug. 30	.18	.35	.42	.44	.44	.44	.44	.64	.74	.74	.74	.74
Sept. 18	.18	.31	.34	.43	.49	.71	.76	.76	.76	.76	.76	.76
Sept. 26	.23	.37	.49	.54	.57	.58	.58	.58	.58	.58	.58	.58
Oct. 2	.38	.63	.80	.88	1.05	1.34	1.64	2.06	2.08	2.08	2.08	2.08
Oct. 22	.28	.37	.42	.45	.46	.47	.47	.47	.47	.47	.47	.47
Nov. 13	.30	.42	.43	.45	.47	.61	.71	.73	.73	.73	.73	.77
Nov. 17	.46	.63	.79	.96	1.10	1.39	1.99	2.39	2.53	2.53	2.56	2.57
HAWAII												
Hilo Airport, T. H.												
Feb. 24	.35	.67	.88	1.05	1.42	1.76	2.25	2.44	2.56	2.74	2.91	2.98
Mar. 8	.16	.29	.37	.42	.58	.83	.90	1.00	1.25	1.45	1.64	1.73
Mar. 8	.26	.45	.50	.52	.53	.81	.97	1.02	1.04	1.07	1.29	1.32
Mar. 9	.25	.42	.67	.88	1.10	1.25	1.72	1.95	2.12	2.20	2.21	2.33
Mar. 9	.12	.23	.26	.35	.50	.51	.70	.90	.95	.96	1.08	1.40
Mar. 10	.28	.43	.59	.68	.74	1.07	1.14	1.24	1.47	1.68	2.34	2.81
Mar. 14	.20	.34	.44	.46	.48	.49	.51	.51	.51	.52	.52	.52
Apr. 5	.18	.30	.37	.41	.49	.53	.55	.58	.58	.58	.58	.58
Nov. 16	.15	.23	.33	.41	.60	.92	1.04	1.20	1.56	1.62	1.85	2.01
Honolulu AP, T. H.												
Jan. 2	.14	.21	.31	.40	.47	.49	.49	.49	.49	.49	.49	.49
Feb. 28	.25	.46	.64	.71	.82	.99	1.18	1.20	1.20	1.20	1.20	1.20
PACIFIC AREA												
Canton Island												
Mar. 8	.15	.24	.35	.43	.51	.85	.99	1.10	1.14	1.25	1.45	1.47
Apr. 12	.13	.23	.35	.46	.53	.55	.58	.60	.61	.61	.62	.63
Apr. 12	.18	.29	.35	.39	.42	.47	.53	.69	.83	.96	1.06	1.17
Apr. 13	.14	.25	.35	.41	.51	.65	.85	.99	1.09	1.30	1.37	1.40
May 3	.19	.30	.46	.64	.75	.88	1.01	1.03	1.03	1.04	1.08	1.10
May 27	.26	.42	.51	.64	.85	.91	.98	.98	1.00	1.01	1.02	1.07
May 28	.17	.25	.37	.51	.69	.73	.81	.82	.82	.82	.82	.82
May 29	.25	.36	.39	.42	.48	.53	.60	.69	.75	.80	.85	.85
May 30	.26	.48	.53	.53	.54	.63	1.06	1.06	1.06	1.06	1.13	1.17
June 17	.20	.35	.44	.48	.51	.51	.90	.99	.99	.99	.99	.99
July 3	.25	.40	.50	.56	.58	.58	.59	.59	.59	.59	.59	.62
July 5	.25	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
July 6	.27	.47	.48	.48	.48	.48	.48	.48	.48	.48	.48	.48
July 24	.17	.25	.37	.51	.69	.79	.79	.79	.79	.79	.79	.79
Aug. 16	.23	.30	.34	.37	.46	.53	.55	.62	.75	.79	.81	.81
Oct. 24	.28	.31	.32	.32	.32	.32	.35	.54	.54	.54	.56	.56



# EXCESSIVE SHORT DURATION RAINFALL

Table 8-Continued

YEAR 1953

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
<b>PACIFIC AREA (Cont'd.)</b>												
Wake Island												
Aug. 19	0.25	0.41	0.45	0.45	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Aug. 19	.15	.28	.40	.47	.58	.81	.88	.96	1.03	1.17	1.33	1.68
Aug. 30	.20	.36	.46	.53	.70	.83	.97	.98	.98	.98	.98	.98
Oct. 8	.20	.40	.60	.65	.65	.65	.65	.65	.65	.65	.65	.65
Nov. 13	.28	.48	.67	.79	.79	.79	.79	.79	.79	.79	.79	.79
Nov. 13	.25	.27	.27	.27	.27	.27	.27	.27	.27	.27	.27	.27
Dec. 22	.25	.35	.35	.37	.43	.47	.52	.54	.56	.59	.60	.60
<b>VIRGIN ISLANDS</b>												
St. Croix Airport												
May 17	.30	.37	.67	.74	.88	1.00	1.12	1.15	1.15	1.15	1.15	1.15
May 23	.17	.32	.40	.41	.41	.42	.42	.42	.42	.42	.42	.42
June 26	.30	.55	.82	1.04	1.34	1.64	2.00	2.07	2.17	2.25	2.45	2.60
Sept. 8	.73	1.17	1.72	2.04	3.01	3.62	4.45	4.71	4.87	4.99	5.15	5.29
Sept. 8	.38	.53	.63	.73	.84	.90	.95	.98	1.01	1.02	1.03	1.07
Oct. 21	.33	.42	.43	.45	.49	.60	.65	.66	.80	.80	.80	.80
Oct. 23	.40	.60	.63	.63	.63	.63	.63	.63	.63	.63	.63	.63
Nov. 3	.35	.44	.50	.53	.58	.59	.60	.60	.61	.62	.64	.70
Nov. 3	.21	.33	.36	.37	.41	.43	.43	.43	.43	.43	.43	.43
Nov. 7	.32	.53	.60	.63	.72	.83	.88	1.13	1.24	1.24	1.24	1.24
Nov. 14	.50	.93	1.13	1.18	1.26	1.40	2.10	2.15	2.15	2.15	2.15	2.15
Nov. 14	.22	.33	.53	.60	.85	1.00	1.00	1.01	1.01	1.01	1.01	1.01
Nov. 15	.25	.45	.60	.72	.87	.92	.95	.96	.99	.99	.99	.99

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
<b>DELAYED DATA:</b>												
<b>MICHIGAN</b>												
Lansing Airport												
May 23, 1952	0.08	0.15	0.31	0.38	0.55	0.72	0.77	0.79	0.82	0.83	0.85	0.85
<b>NEW YORK</b>												
New York												
Apr. 14, 1952	.34	.36	.36	.36	.36	.36	.36	.36	.36	.36	.36	.36
May 31	.24	.42	.46	.51	.51	.55	.89	.97	1.00	1.01	1.01	1.01
June 4	.21	.30	.40	.42	.42	.48	.64	.75	.92	1.12	1.18	1.19
July 4	.23	.36	.44	.49	.50	.54	.54	.55	.57	.57	.57	.57
July 21	.22	.44	.50	.57	.62	.64	.64	.64	.64	.64	.64	.64
July 27	.24	.42	.56	.65	.84	.90	.91	.91	.91	.91	.91	.91
Aug. 6	.37	.60	.76	.95	1.15	1.24	1.27	1.32	1.36	1.42	1.45	1.48
<b>CORRECTIONS:</b>												
<b>SOUTH CAROLINA</b>												
Charleston												
Sept. 6, 1933	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>	<u>30</u>	<u>35</u>	<u>40</u>	<u>45</u>	<u>50</u>	<u>60</u>	<u>80</u>
	0.48	0.98	1.44	1.89	2.19	2.42	2.61	2.82	3.04	3.45	4.07	5.20
	<u>100</u>	<u>120</u>										
	6.03	6.04										

Table 9

## SUNSHINE, AMOUNT AND PERCENT

YEAR 1953

Station	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible
ALABAMA																										
Birmingham	172	54	180	59	208	56	284	73	273	63	301	70	252	57	284	69	272	73	302	86	220	70	148	48	2896	65
Mobile CO	159	49	101	32	169	46	220	57	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Montgomery	153	48	129	42	187	50	272	70	285	66	299	70	279	64	278	67	254	69	272	77	181	57	140	45	2729	61
ARIZONA																										
Phoenix CO	277	88	271	88	317	85	351	90	397	92	411	96	358	82	374	90	361	97	329	93	290	93	291	94	4027	91
Prescott	249	79	246	80	323	87	350	89	398	92	421	97	292	66	327	79	347	93	319	91	240	77	245	80	3757	84
Tucson	287	90	269	87	302	81	347	89	382	89	400	94	293	67	356	86	361	97	337	95	276	87	283	91	3893	88
Yuma	283	89	296	96	343	92	378	97	409	95	418	96	382	88	400	97	368	99	346	98	279	88	284	91	4186	94
ARKANSAS																										
Ft. Smith	148	47	177	58	233	63	265	68	306	70	398	91	306	69	336	80	346	93	236	67	179	58	150	49	3080	69
Little Rock	124	39	174	57	189	51	265	66	277	64	361	83	240	55	305	73	332	89	263	75	198	64	145	47	2868	64
CALIFORNIA																										
Eureka CO	47	16	150	50	193	52	166	41	198	44	236	52	227	50	162	38	140	37	196	57	48	16	127	44	1890	42
Fresno	182	59	268	88	333	87	356	90	380	87	406	92	438	98	413	99	360	97	329	94	193	63	217	72	3875	87
Los Angeles CO	237	75	278	91	313	84	257	66	359	83	307	71	375	85	348	84	302	81	315	90	254	81	284	92	3629	82
Red Bluff	135	45	256	86	298	80	302	76	338	76	377	84	455	100	466	86	351	94	299	87	106	35	194	67	3477	78
Sacramento	102	34	215	71	253	68	278	70	278	63	391	88	451	100	386	91	348	93	297	86	108	36	189	64	3296	74
San Diego	228	71	272	88	288	77	209	54	311	72	278	65	293	67	254	61	250	67	290	82	235	74	277	89	3185	72
San Francisco CO	135	44	222	73	280	76	252	64	315	71	349	79	313	70	221	53	204	55	282	81	143	47	239	80	2955	66
COLORADO																										
Denver	194	64	197	66	276	74	230	58	282	63	328	73	302	66	320	75	305	82	256	74	189	63	188	64	3067	69
Grand Junction	153	50	187	62	235	63	212	53	227	51	330	74	284	63	268	63	321	86	278	80	206	68	207	70	2908	65
Pueblo	255	84	250	83	300	82	310	78	344	78	351	79	309	69	299	71	296	79	250	72	238	79	229	77	3431	78
CONNECTICUT																										
Hartford	126	43	184	62	181	49	199	50	244	54	375	82	367	79	331	77	291	78	211	62	161	55	145	51	2815	65
New Haven	116	39	179	60	159	43	188	47	227	51	345	76	339	74	311	75	281	75	223	65	163	55	165	57	2696	60
FLORIDA																										
Apalachicola CO	192	59	116	37	202	54	254	65	364	86	280	66	270	63	197	48	196	53	267	75	171	53	120	38	2629	59
Jacksonville	184	57	170	54	223	60	272	71	345	81	242	57	239	56	181	41	142	38	203	57	152	48	135	43	2488	56
Key West CO	245	73	255	80	321	86	325	85	324	78	225	55	256	52	244	61	192	52	231	64	184	56	165	50	2967	67
Miami CO	217	65	227	72	307	83	294	77	347	84	191	46	294	70	226	56	154	42	183	51	203	62	226	69	2869	65
Pensacola CO	195	60	143	46	212	57	285	66	308	72	293	69	313	73	250	61	275	74	306	86	207	65	132	42	2889	64
Tampa	205	63	197	63	297	80	287	69	361	87	268	65	305	72	261	64	189	51	251	70	210	65	200	62	3031	68
GEORGIA																										
Atlanta	125	39	141	46	185	50	262	67	276	64	258	60	252	58	307	74	256	69	272	87	180	58	137	44	2651	59
Macon	159	50	143	46	202	54	285	73	311	72	287	67	288	66	326	79	246	66	262	80	223	71	140	45	2892	64
Savannah	167	52	141	46	195	52	265	68	304	71	212	50	247	57	174	42	157	42	250	71	243	77	142	45	2497	56
IDAHO																										
Boise	55	19	155	53	200	54	229	57	245	54	321	70	453	97	320	74	303	81	234	69	80	28	97	35	2692	60
Pocatello	48	17	112	38	201	54	247	62	248	55	348	76	388	84	377	88	327	87	255	74	129	41	67	24	2747	62
ILLINOIS																										
Cairo CO	100	33	182	60	228	61	241	61	279	64	379	86	377	84	376	89	325	87	277	79	231	75	163	54	3158	71
Chicago	80	27	149	49	151	41	137	34	255	57	357	79	330	72	333	78	303	81	259	75	164	56	145	51	2663	60
Moline	67	23	137	46	159	43	135	34	249	55	317	70	354	77	310	79	302	81	248	72	175	59	113	39	2596	58
Peoria	62	21	152	51	175	47	206	52	273	61	363	80	376	82	342	80	307	82	269	78	180	60	143	50	2848	64
Springfield	78	26	147	49	169	46	169	56	216	55	359	80	371	82	356	84	336	90	273	79	196	65	153	52	2853	64
INDIANA																										
Evansville	81	26	179	59	218	59	226	57	289	65	400	90	391	87	378	90	320	86	288	83	211	69	152	51	3133	70
Ft. Wayne	67	22	138	46	162	44	199	50	279	62	349	77	349	76	329	77	265	71	266	77	151	51	90	31	2644	59
Indianapolis	76	25	167	56	177	48	190	41	286	64	380	85	386	85	348	82	283	76	273	79	205	68	140	48	2911	64
Terre Haute	74	24	161	53	173	47	175	39	249	56	369	82	366	81	325	77	279	75	251	72	203	67	127	43	2752	62
IOWA																										
Burlington	108	36	192	64	203	55	222	56	304	68	369	82	397	87	382	89	340	91	281	82	213	72	182	63	3193	70
Des Moines	106	36	140	50	183	49	195	49	249	55	321	71	357	78	354	83	327	87	257	75	181	61	147	52	2826	63
Sioux City	159	54	137	46	203	55	209	52	308	68	354	77	362	78	359	83	335	89	278	81	163	55	157	55	3024	66
KANSAS																										
Concordia CO	185	61	198	66	185	50	211	53	264	59	354	79	332	73	363	85	315	84	266	77	196	65	194	66	3063	69
Dodge City	220	72	219	72	238	64	301	76	322	73	363	82	345	77	339	81	344	92	263	76	198	65	214	72	3366	75
Topeka	145	48	167	50	204	55	214	54	266	60	339	76	336	74	348	82	331	89	250	72	175	58	175	59	2950	65
Wichita	219	71	223	74	229	62	283	71	293	67	328	74	270	60	340	81	328	88	241	69	210	69	202	68	3166	73
KENTUCKY																										
Louisville	61	20	170	56	167	45	172	44	255	58	383	86	354	79	342	82	298	80	279	80	202	67	172	58	2855	63
LOUISIANA																										
New Orleans CO	201	62	157	50	221	59	275	71	308	63	386	68	258	60	260	64	309	83	299	84	187	58	131	41	2892	64
Shreveport	204	64	178	58	205	55	248	64	260	61	381	89	301	69	260	63	322	87	291	82	211	67	163	52	3024	68
MAINE																										
Eastport CO	107	37	133	45	160	43	142	35	205	45	209	45	290	61	271	62	---	---	---	---	---	---	---	---	---	---
Portland	153	53	160	55	176	48	166	41	251	55	323	70	324	69	288	67	257	69	220	64	169	58	174	63	2661	60
MARYLAND																										
Baltimore	110	37	151	50	167	45	153	38	224	50	321	72	374	83	309	73	287	77	246	71	159	53	173	59	2674	59
MASSACHUSETTS																										
Blue Hill Observatory	115	40	149	52	137	38	152	39	202	46	327	74	273	61	258	63	246	69	170	52	133	47	146	53	2308	54
Boston	141	48	167	56	157	42	173	43	223	49	352	77	297	64	272	63	272	73	190	56	160	55	182	64	2586	58
Nantucket	106	36	178	60	179	48	214	54	227	50	331	73	275	60	268	63	244	65	188	54	154	52	145	51	2509	56
MICHIGAN																										
Alpena CO	52	18	100	34	1																					



Table 9—Continued

## SUNSHINE, AMOUNT AND PERCENT

YEAR 1953

Station	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible
MISSOURI																										
Columbia	121	40	173	57	176	47	196	49	290	65	353	79	325	72	303	72	327	88	253	73	229	76	177	60	2923	66
Kansas City	135	45	178	59	215	58	215	54	272	61	372	84	366	81	364	86	345	92	270	78	180	60	174	59	3086	68
St. Joseph	130	43	153	51	191	51	183	46	211	47	315	70	315	69	319	75	336	90	262	76	213	71	189	65	2817	63
St. Louis CO	108	36	179	59	231	62	244	62	338	76	398	90	379	84	345	82	317	85	286	83	245	81	166	56	3236	73
Springfield	127	41	198	65	225	61	205	52	256	58	383	87	348	78	364	87	340	91	240	69	228	74	172	58	3086	69
MONTANA																										
Billings	90	32	115	40	209	57	187	46	240	52	304	65	401	84	331	76	275	73	248	73	211	74	156	58	2767	62
Great Falls	67	24	99	34	220	60	178	44	237	51	279	59	437	91	355	81	263	70	226	67	160	57	106	40	2627	59
Havre CO	90	33	152	53	205	55	149	36	197	42	228	47	377	78	310	70	232	61	223	67	130	47	105	40	2398	54
Helena	98	35	126	44	244	66	230	56	284	61	325	69	450	94	346	79	306	81	258	77	149	53	129	48	2945	66
Missoula	27	10	94	33	145	39	172	42	207	44	243	51	450	94	310	71	286	76	223	66	134	47	56	21	2347	52
NEBRASKA																										
Lincoln CO	178	59	172	58	205	55	206	52	286	64	342	76	332	73	357	84	327	87	286	83	171	57	193	67	3055	68
North Platte	151	51	177	59	260	70	251	63	299	67	338	75	313	68	284	67	323	86	292	85	182	61	185	64	3055	69
Omaha	134	45	155	52	183	49	221	55	276	61	328	72	334	73	332	78	314	84	264	77	165	56	157	55	2863	64
Valentine CO	190	65	194	66	271	73	244	61	311	68	337	73	292	63	306	71	337	90	286	83	178	61	168	60	3114	70
NEVADA																										
Ely	164	54	194	65	263	71	239	60	259	58	357	80	296	65	358	85	283	76	242	70	150	50	195	66	3000	67
Las Vegas	259	84	271	89	356	96	318	81	377	86	399	91	339	76	356	85	349	94	304	87	243	79	232	77	3803	86
Reno	184	61	234	78	290	78	272	68	262	59	339	76	432	95	366	86	359	96	297	86	199	66	187	64	3421	77
Winnemucca	164	55	205	67	288	78	277	69	288	64	332	82	445	97	391	91	340	91	279	81	173	58	170	59	3392	76
NEW HAMPSHIRE																										
Concord	94	32	129	44	135	36	139	36	242	53	328	71	304	65	277	64	254	68	207	61	148	51	142	51	3399	53
Mt. Washington Obs.	126	42	70	24	137	37	144	35	220	47	241	51	193	41	193	44	138	36	183	55	123	42	64	23	1832	40
NEW JERSEY																										
Atlantic City CO	134	44	191	64	199	54	199	50	204	46	315	70	355	78	331	78	301	81	271	78	202	67	155	53	2857	64
Trenton CO	135	45	202	67	174	47	211	53	199	45	328	73	330	72	311	73	282	75	245	71	181	60	157	54	2755	62
NEW MEXICO																										
Albuquerque	253	81	214	70	273	73	287	73	328	76	352	81	310	70	327	78	355	95	301	86	249	80	221	72	3470	78
NEW YORK																										
Albany	90	30	162	55	152	41	152	38	207	46	327	71	301	65	287	67	244	65	207	60	103	35	111	39	2343	51
Binghamton	45	15	123	41	116	31	135	34	216	48	345	76	329	71	306	71	232	62	233	68	122	41	84	29	2286	51
Buffalo	92	31	138	47	106	29	144	36	167	37	329	72	314	67	297	69	219	58	217	63	100	34	88	31	2211	50
New York CO	123	41	178	60	171	46	197	49	203	45	345	76	331	72	312	73	279	75	229	67	180	60	150	52	2698	60
Oswego CO	61	21	122	41	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Rochester	80	27	143	49	142	38	192	48	197	43	332	72	362	78	329	76	259	69	217	63	111	38	82	29	2446	53
Syracuse	90	31	153	52	162	44	179	45	232	51	352	77	335	72	315	73	247	66	208	61	87	30	73	26	2433	58
NORTH CAROLINA																										
Asheville CO	163	52	181	59	218	59	283	72	327	75	327	75	325	73	307	74	270	73	290	83	226	73	139	46	3056	68
Charlotte	191	61	190	62	217	59	304	78	323	74	316	73	332	75	343	82	276	74	293	84	238	77	166	55	3189	72
Greensboro	164	53	176	58	194	52	261	66	275	63	273	62	351	79	281	67	268	72	280	80	218	71	162	54	2903	65
Hatteras CO	128	41	131	43	189	51	261	67	291	67	300	69	276	63	240	58	228	61	202	58	173	56	150	49	2569	57
Raleigh CO	150	48	137	45	183	49	275	70	331	76	311	71	337	76	297	71	249	67	233	67	182	59	168	55	2853	64
Wilmington	157	50	147	48	195	53	268	69	323	75	298	69	267	61	240	58	198	53	221	63	205	66	171	56	2690	60
NORTH DAKOTA																										
Bismarck	105	37	152	53	175	47	161	40	265	57	238	50	366	77	287	65	260	69	243	72	154	55	128	48	2534	57
Devils Lake CO	103	38	170	59	212	57	241	59	242	51	269	56	391	81	348	79	260	69	239	71	138	50	113	43	2726	61
Fargo	92	33	147	51	181	49	178	44	262	56	266	56	367	77	276	63	238	63	241	71	171	61	164	62	2583	58
Williston CO	111	40	180	63	208	56	226	55	274	58	280	58	423	88	372	84	268	71	247	74	171	62	101	39	2861	63
OHIO																										
Cincinnati Observatory	84	28	180	60	166	45	148	38	217	49	318	71	310	69	335	79	302	81	268	77	174	58	142	48	2644	59
Cleveland	44	15	109	37	101	27	149	37	216	48	303	67	317	69	309	72	246	66	216	63	151	51	148	52	2309	50
Columbus	43	14	130	44	130	35	170	43	260	58	354	79	372	82	363	85	299	80	267	77	160	53	109	37	2657	60
Dayton	36	12	148	49	117	32	158	40	263	59	357	80	353	78	337	79	273	73	262	76	168	56	126	43	2598	58
Sandusky CO	68	23	139	47	105	28	172	43	246	55	336	74	350	76	334	78	277	74	237	69	124	42	119	42	2507	56
Toledo	28	9	99	33	95	26	149	37	228	51	342	75	327	71	315	74	283	76	236	69	120	40	96	34	2318	52
OKLAHOMA																										
Oklahoma City	227	73	215	70	255	69	284	72	323	74	380	87	328	74	349	84	351	94	216	62	201	65	196	65	3325	76
Tulsa	176	57	202	66	243	66	242	61	300	69	380	87	321	72	353	84	342	92	247	71	193	63	168	56	3167	70
OREGON																										
Baker CO	78	27	158	54	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Portland	43	15	106	35	120	32	118	29	144	31	131	27	345	73	188	43	207	55	137	41	34	12	36	13	1609	36
Roseburg	97	33	99	34	145	39	173	43	164	36	216	47	413	89	246	57	245	65	163	48	52	18	43	15	2056	46
PENNSYLVANIA																										
Erie CO	63	21	67	23	112	30	150	37	188	42	312	69	347	75	285	67	---	---	---	---	---	---	---	---	---	---
Harrisburg	75	25	162	54	176	48	191	48	250	56	352	78	386	85	323	76	275	73	269	78	160	53	119	41	2738	61
Philadelphia CO	126	42	188	63	202	54	214	54	232	52	325	72	355	78	306	72	297	79	235	68	155	52	122	42	2757	61
Pittsburgh	111	46	162	54	145	39	136	34	228	51	304	67	273	60	227	53	256	69	226	65	120	40	73	25	2261	55
Reading CO	89	30	160	53	164	44	144	36	190	42	330	73	385	84	313	74	254	68	247	71	144	48	134	46	2554	56
Scranton CO	76	26	154	52	129	35	136	34	168	37	323	71	333	72	294	69	229	61	239	69	145	49	113	40	2339	51
RHODE ISLAND																										
Providence	122	41	171	58	164	44	169	42	230	51	366	80														

Table 9-Continued

## SUNSHINE, AMOUNT AND PERCENT

YEAR 1953

Station	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible
TEXAS (Cont'd.)																										
El Paso	294	92	231	75	286	77	349	90	405	95	393	92	362	83	378	92	363	98	312	88	302	96	273	87	3948	89
Galveston CO	230	71	118	38	190	51	210	54	228	54	377	90	329	77	209	51	286	77	244	69	183	57	114	36	2718	61
Houston CO	220	68	119	36	189	51	240	67	260	62	387	92	320	75	368	66	313	85	250	70	202	63	138	43	3006	65
Port Arthur CO	243	75	105	34	184	49	226	59	265	62	359	85	255	59	229	56	311	84	267	75	186	58	113	36	2745	--
San Antonio	260	80	160	50	181	49	252	60	263	62	339	81	360	84	303	74	309	83	239	67	195	61	180	56	3041	68
UTAH																										
Salt Lake City	107	36	168	56	210	57	234	59	294	66	372	83	370	81	353	83	324	87	277	80	172	58	164	57	3045	68
VERMONT																										
Burlington	81	28	91	31	152	41	129	32	261	57	317	68	276	59	279	64	179	48	170	50	61	21	70	25	2066	44
VIRGINIA																										
Cape Henry CO	135	44	157	52	213	57	266	67	297	68	342	78	359	80	---	---	---	---	---	---	---	---	---	---	---	---
Lynchburg	119	39	177	58	207	56	255	65	300	68	276	63	348	70	299	71	295	79	294	84	214	70	161	54	2945	66
Norfolk CO	167	54	183	60	230	62	288	73	346	79	336	76	358	84	336	80	314	84	261	75	173	56	179	60	3171	73
Richmond	138	45	165	54	197	53	243	62	294	67	294	66	340	78	298	71	296	79	268	77	188	62	169	57	2898	65
Washington Nat'l. Airport	122	40	166	55	199	54	165	42	218	49	286	64	350	77	285	67	282	75	264	76	213	71	153	52	2703	60
WASHINGTON																										
North Head CO	25	9	111	38	140	38	146	36	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Seattle CO	11	4	77	27	129	35	110	27	231	49	174	36	309	64	239	54	217	57	171	51	59	21	38	14	1765	39
Spokane	28	10	117	41	176	48	205	50	314	67	260	54	446	92	358	81	311	82	237	71	73	26	57	22	2582	58
Tacoma CO	11	4	90	31	116	31	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Tatoosh Island	10	4	99	35	117	32	152	37	303	43	198	41	288	59	190	43	192	51	143	43	35	13	15	6	1742	37
Walla Walla CO	62	24	161	55	229	62	279	69	331	71	358	76	465	98	356	81	326	87	243	72	62	22	58	22	2930	66
WEST VIRGINIA																										
Elkins	99	32	112	37	133	36	137	34	206	46	288	65	306	68	298	70	248	66	238	69	177	59	109	37	2351	53
Parkersburg CO	31	10	111	37	116	31	123	31	223	50	284	64	282	62	296	70	230	62	236	68	137	45	90	31	2159	49
WISCONSIN																										
Green Bay	89	31	154	53	167	45	191	47	237	52	308	66	302	64	317	73	280	75	226	66	139	48	99	36	2509	56
Madison	105	36	149	50	171	46	174	43	274	60	332	72	298	64	346	80	303	81	257	75	152	52	110	39	2671	60
Milwaukee	71	24	131	44	137	37	185	46	277	61	337	73	351	75	330	77	284	76	242	71	160	55	118	42	2623	59
WYOMING																										
Cheyenne	183	62	180	60	262	71	226	57	249	56	330	73	291	63	280	66	305	81	265	77	205	69	195	68	2971	67
Lander	201	69	195	66	290	78	269	67	276	61	392	86	386	83	333	77	316	84	232	68	181	62	217	77	3288	75
Sheridan	97	34	135	46	239	65	193	48	223	48	309	66	362	77	309	71	287	76	249	73	174	61	135	49	2712	61
PACIFIC AREA																										
Honolulu T.H.	248	73	212	66	262	70	257	68	299	73	304	76	314	76	307	77	256	70	265	73	225	68	211	63	3160	71
Lihue T.H.	203	60	185	58	219	59	196	52	219	54	212	53	202	49	165	41	205	56	191	53	115	35	142	42	2254	50
PUERTO RICO																										
San Juan	241	70	250	77	323	87	346	92	308	76	312	79	330	81	309	78	269	73	280	77	256	76	219	64	3443	78
ALASKA																										
Anchorage	116	57	89	35	263	71	261	59	294	54	390	68	304	54	121	25	127	33	139	45	105	48	36	20	2245	49
Juneau	63	28	46	17	103	28	152	35	215	41	272	50	183	34	124	26	39	10	24	8	98	42	49	24	1368	30
Nome	124	73	113	47	181	49	233	51	361	62	234	37	292	48	70	14	126	32	148	49	38	20	49	38	1969	43



# ANNUAL CLIMATOLOGICAL DATA

Table 10

State and Station	Temperature				Precipitation				Relative humidity				Wind				Number of days				Max temp.	Min temp.	Zero and below																		
	Averages		Extremes		Total	Greatest in 24 hrs	Date	Snow, Sleet, Hail		1:30a. P. S. T.	7:30a. P. S. T.	7:30p. P. S. T.	Average hourly speed	Prevailing direction	Speed	Direction	Fastest mile	Percent of possible sunshine	Average sky cover	Sunrise to sunset				Snow, Sleet, Hail 10 or more	Thunderstorms	Heavy fog															
	Daily maximum	Daily minimum	Monthly	Highest				Date	Lowest											Date																					
ALABAMA	75.5	52.0	63.8	99	Jun. 20	14	Dec. 18	2483	49.96	4.27	Jan. 8-9	T	T	Dec. 14	77	80	49	57	8.5	NE	47	W	22	Mar.	65	5.3	133	99	133	115	0	51	8	82	0	40	0				
	78.2	58.0	68.1	101	Jun. 19	27	Dec. 19	1460	66.95	4.46	Dec. 5-6	.0	.0	---	85	87	58	75	10.4	---	---	---	---	Jun.	5.6	117	112	136	128	0	80	41	91	0	9	0					
	77.0	54.4	65.7	100	Aug. 8	19	Dec. 19	2014	59.08	8.81	Sept. 26-27	T	T	Dec. 25	83	87	55	66	5.8	NE	51	NW	10	Jun.	61	5.5	123	100	142	113	0	59	22	90	0	23	0				
	61.4	29.4	45.4	90	Jul. 3	-5	Mar. 15	7115	12.81	1.70	Nov. 17-18	31.0	9.0	Mar. 1	---	71	36	---	---	---	---	---	Dec.	---	4.2	181	85	99	56	8	54	1	2	16	230	4					
	84.5	55.3	69.9	112	Dec. 2	25	Dec. 24	1472	3.56	.71	Aug. 15-16	T	T	May 15	44	55	30	24	5.4	E	35	W	4	Dec.	91	2.9	233	85	47	20	0	15	0	145	0	16	0				
	70.9	39.6	55.3	100	Feb. 2	11	Dec. 24	4355	9.93	1.24	Mar. 27	6.5	2.7	Feb. 28	46	55	28	26	9.7	SW	56	SW	27	Apr.	84	3.6	201	101	63	48	2	47	0	53	0	136	0				
	83.2	53.8	68.5	110	Jul. 1	23	Dec. 21	1635	5.34	.85	Jul. 29	.5	.5	Feb. 24	34	43	23	20	7.2	SE	43	E	11	Jul.	88	1.2	225	76	64	35	0	40	1	144	0	34	0				
	71.5	39.3	55.4	101	Aug. 3	-4	Dec. 31	4636	6.14	.73	Aug. 27-28	6.8	3.6	Dec. 27	42	54	28	23	8.4	SE	59	WSW	18	Feb.	---	1.6	201	95	69	39	1	29	2	82	4	143	3				
	89.2	59.1	74.2	114	Dec. 17	31	Dec. 25	736	.31	.18	Mar. 2	.0	.0	---	34	43	23	16	8.4	N	43	NW	4	Mar.	94	2.0	283	54	28	4	0	3	0	171	0	4	0				
	ARKANSAS	74.6	49.6	62.1	105	Jun. 19	9	Dec. 24	3170	40.91	3.62	Mar. 16-17	.6	.6	Jan. 16	76	84	51	53	8.1	NE	42	W	23	Apr.	69	4.2	186	83	96	75	0	50	8	110	2	74	0			
Fort Smith	74.9	52.8	63.9	102	Jun. 20	14	Dec. 24	2772	43.17	2.46	Mar. 17	T	T	Dec. 14	74	81	52	55	8.4	SW	61	SE	29	Apr.	64	4.8	163	80	122	83	0	55	11	106	1	34	0				
Little Rock	76.5	53.7	65.1	102	Sept. 28	16	Dec. 24	2325	47.04	3.14	Jul. 17	T	T	May 19	---	85	55	60	---	---	---	---	---	---	---	4.8	157	91	117	96	0	57	17	104	1	33	0				
Texarkana	CALIFORNIA	77.2	50.3	63.8	107	Jan. 21	28	Dec. 24	2179	4.17	Mar. 18-19	T	T	Feb. 23	57	69	48	36	4.9	ENE	35	WNW	28	Mar.	---	3.3	218	73	74	26	0	1	20	93	0	16	0				
Bakersfield	75.7	36.6	56.2	105	Jul. 23	9	Dec. 24	4143	2.58	.95	May 15	T	T	Dec. 14	---	24	19	---	---	---	---	---	---	---	---	3.4	209	92	64	28	0	23	0	95	0	158	0				
Bishop	57.9	41.4	49.7	89	Sept. 10	16	Dec. 31	5862	66.39	4.17	Apr. 26-27	27.50	21.7	Mar. 19	---	---	47	52	---	---	---	---	---	---	---	4.8	163	66	136	96	44	19	70	0	6	97	0				
Blue Canyon	76.5	50.7	63.6	102	Sept. 10	33	Dec. 25	1509	3.86	1.04	Nov. 14	.0	.0	---	64	70	43	40	4.3	S	38	NNW	20	Nov.	---	3.4	223	75	67	20	0	1	24	43	0	0	0	0			
Burbank	57.7	47.0	52.4	77	Oct. 4	33	Dec. 24	4502	50.32	3.85	Jul. 17-18	T	T	Dec. 14	---	---	---	---	7.2	N	48	SW	19	Oct.	42	7.1	61	96	208	137	0	4	26	0	0	0	0	0			
Eureka CO	75.4	47.9	61.7	105	Oct. 23	26	Dec. 22	2595	6.13	1.35	Nov. 14	T	T	Jan. 14	68	83	56	41	6.0	NW	31	NE	21	Nov.	87	3.4	216	77	72	29	0	4	43	85	0	31	0				
Fresno	74.7	54.5	64.6	101	5	38	Dec. 2	1122	4.08	1.03	Nov. 14	.0	.0	---	---	---	---	---	6.3	W	40	NW	20	Nov.	82	3.3	219	89	57	24	0	2	17	18	0	0	0	0			
Los Angeles CO	70.5	53.1	61.8	101	4	36	Dec. 26	1531	4.76	1.05	Nov. 14	.0	.0	---	76	78	54	62	6.7	WSW	157	N	18	Feb.	---	3.9	182	102	81	19	0	1	46	5	0	0	0	0			
Los Angeles	62.0	37.3	49.7	95	10	16	Dec. 27	5767	32.89	3.20	Dec. 13-14	73.0	17.0	Mar. 18	71	78	56	49	---	---	---	---	---	---	---	5.6	129	74	162	97	17	4	9	16	1	123	0				
Mt. Shasta CO	65.9	48.6	57.3	96	13	32	Dec. 3	2856	9.87	1.53	Apr. 26-27	T	T	Mar. 1	81	86	69	62	6.6	W	49	N	23	Feb.	---	4.8	155	101	109	61	0	1	24	5	0	1	0	0			
Oakland	74.9	50.4	62.7	109	Sept. 14	30	Dec. 31	2441	15.28	2.26	Apr. 23	.3	.3	May 23	58	67	47	37	9.0	SSE	63	SE	19	May	78	4.8	165	67	133	71	0	13	12	86	0	8	0				
Red Bluff	73.7	49.0	61.4	104	Oct. 21	31	Dec. 20	2364	12.16	1.87	Feb. 26-27	AP	AP	May 25	72	82	58	43	9.2	SW	70	SE	13	May	74	3.8	198	81	86	55	0	3	32	64	0	3	0	0	0		
Sacramento CO	64.4	45.0	54.7	95	4	20	Dec. 20	4581	4.18	1.60	Nov. 14	T	T	Nov. 14	48	54	40	40	18.0	NW	191	NW	Feb.	---	3.2	220	82	63	25	2	3	83	26	0	60	0	0	0	0	0	
Sandberg CO	71.2	55.1	63.2	96	5	38	Dec. 20	1223	3.41	.65	Nov. 14-15	T	T	Mar. 29	75	75	55	58	6.1	WNW	30	SW	23	Feb.	72	3.8	191	111	63	26	0	1	20	6	0	0	0	0	0		
San Diego	62.9	50.7	56.8	89	13	40	Dec. 1	2973	12.65	2.36	Apr. 26-27	T	T	Mar. 1	---	---	67	---	8.7	W	41	S	13	Nov.	66	5.0	141	107	117	70	0	0	13	0	0	0	0	0			
San Francisco CO	64.5	47.5	56.0	94	13	33	Dec. 3	3242	9.20	1.29	Nov. 13-14	T	T	Apr. 7	83	88	69	67	11.5	WNW	55	SSW	13	Apr.	---	4.8	155	99	111	60	0	0	23	2	0	0	0	0	0		
San Francisco	69.1	45.0	57.1	104	10	27	Dec. 25	2901	5.71	1.66	Nov. 14	T	T	Mar. 1	82	83	54	58	7.6	W	44	NNE	21	Mar.	---	3.6	203	104	58	31	0	2	86	6	0	12	0	0	0	0	
Santa Maria	COLORADO	59.5	24.2	41.9	89	3	Dec. 28	8427	6.49	.81	Jul. 16-17	29.0	3.9	Dec. 2	---	74	39	41	---	---	---	---	---	---	---	---	3.9	187	119	59	56	11	37	9	0	32	243	41	0	0	0
Alamosa	63.1	36.2	49.7	97	Oct. 26	-5	Dec. 21	5992	10.16	.71	Jun. 18-19	30.9	5.6	Apr. 4	54	58	33	36	12.2	NNW	60	W	6	Dec.	---	4.6	155	116	94	85	12	62	16	16	18	162	2	0	0		
Colorado Springs	65.2	38.4	51.8	99	Jun. 29	-2	Dec. 21	5435	14.23	1.76	May 16-17	71.6	9.5	Feb. 19	54	59	34	36	8.7	S	51	NE	10	May	69	5.1	129	128	108	86	21	34	8	31	16	147	2	0	0		
Denver	65.2	40.6	52.9	101	Jul. 4	6	Dec. 21	5431	9.23	1.21	Aug. 1	24.1	3.2	Mar. 30	51	59	40	37	9.0	ESE	61	SW	27	Mar.	65	4.8	147	100	118	77	8	39	4	52	12	141	0	0	0		
Grand Junction																																									

See reference notes at end of table.

## ANNUAL CLIMATOLOGICAL DATA

Table 10—Continued

YEAR 1953

State and Station	Temperature				Precipitation				Relative humidity			Wind				Number of days																					
	Averages		Extremes		Degree days	Snow, Sleet, Hail			Relative humidity		Wind				Number of days																						
	Daily maximum	Daily minimum	Monthly	Lowest		Date	Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Average hourly speed	Prevailing direction	Fastest mile		Percent of possible sunshine	Average sky cover	Sunrise to sunset			Precipitation 0.1 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	Max. temp. 90° and above	Min. temp. 32° and below	Zero and below										
					Direction									Date	Clear			Partly cloudy	Cloudy																		
COLORADO (Cont'd.)	69.8	38.2	54.0	103	25	Dec.	4992	8.87	1.75	Aug. 18	24.9	4.9	10-11	56	66	34	35	8.0	WNW	56	NW	23	Nov.	78	4.4	166	105	94	65	9	42	4	67	7	154	2	
Pueblo																																					
CONNECTICUT	62.4	45.3	53.9	99	2	Sept.	4798	44.35	3.45	Jul. 22	9.3	5.4	6-7	Nov.	76	57	70	---	---	---	---	---	---	---	5.8	111	111	143	105	4	24	32	14	6	81	0	
Bridgeport																																					
Hartford	63.2	42.0	52.6	101	2	Dec.	5196	52.37	2.43	Dec. 13	27.3	7.5	8-9	Jan.	82	80	53	68	7.5	S	50	NW	15	65	6.2	91	105	169	135	8	27	53	23	12	110	0	
New Haven	60.9	43.7	52.3	97	29	Dec.	5153	53.67	4.29	Jul. 23	11.8	3.4	6	Nov.	80	60	---	---	7.4	---	36	SW	7	60	6.1	105	103	157	127	7	26	33	6	8	94	0	
DELAWARE																																					
Wilmington	66.0	45.9	56.0	101	31	Dec.	4346	45.15	2.94	Oct. 28	23.6	11.9	6-7	Nov.	81	79	54	68	8.2	NW	38	NW	7	77	5.8	110	103	152	112	6	34	45	34	5	84	0	
DIST. OF COLUMBIA																																					
Washington CO	68.8	50.1	59.5	103	30	Dec.	3546	44.17	4.05	Sept. 5	10.7	6.5	6-7	Nov.	74	74	50	60	7.0	SSW	47	SW	22	60	5.5	121	100	144	116	4	38	15	50	2	47	0	
Washington	68.1	49.7	58.9	100	2	Sept.	3617	51.17	4.32	May 4	11.3	6.6	6-7	Nov.	74	74	50	60	9.2	SSW	49	SW	22	60	5.5	121	100	144	112	4	37	15	44	2	53	0	
Silver Hill Obs.	67.7	48.7	58.2	101	31	Dec.	3742	49.50	2.93	May 5	16.9	7.5	6	Nov.	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FLORIDA																																					
Apalachicola CO	75.6	62.4	69.0	96	18	Dec.	1051	74.29	8.95	Oct. 25	0	0	---	---	86	87	70	78	8.3	---	52	SE	26	59	5.2	138	99	128	123	0	73	35	21	0	2	0	
Daytona Beach	80.3	62.2	71.3	100	26	Dec.	647	79.29	9.29	8-9	0	0	---	---	90	89	62	80	10.5	SSW	46	S	12	59	5.9	98	121	146	140	0	94	30	51	0	0	0	
Fort Myers	84.4	63.9	74.2	99	26	Dec.	271	58.07	5.70	Jun. 18	0	0	---	---	91	89	58	79	8.2	E	45	SW	9	57	5.7	102	142	121	130	0	99	20	113	0	0	0	
Jacksonville	78.7	62.4	70.6	99	26	Dec.	895	65.32	4.09	Aug. 21	0	0	---	---	85	85	54	72	9.2	WSW	52	SW	12	56	6.1	95	118	152	135	0	54	41	63	0	2	0	
Key West CO	84.0	72.2	73.1	94	24	Dec.	39	46.39	6.65	Nov. 27	0	0	---	---	81	81	68	77	8.2	E	38	SW	9	67	5.3	111	167	87	113	0	59	2	81	0	0	0	
Lakeland CO	81.2	64.1	72.7	97	26	Dec.	44	59.61	3.67	Nov. 24	0	0	---	---	---	---	---	---	6.6	NE	---	---	---	---	5.9	93	138	134	142	0	116	22	68	0	0	0	
Melbourne	80.7	64.5	72.6	95	27	Dec.	420	64.02	3.90	Nov. 24	0	0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Miami CO	80.4	69.9	75.2	91	18	Dec.	148	71.27	4.03	Dec. 17	T	T	9	May	84	83	62	74	11.9	---	48	SW	9	65	5.0	115	171	79	150	0	69	4	4	0	0	0	
Miami Beach	81.1	71.6	76.4	94	18	Dec.	81	71.10	3.32	Dec. 28	0	0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Orlando	82.4	62.6	72.5	99	27	Dec.	534	65.85	2.99	Nov. 24	0	0	---	---	90	90	58	76	9.1	N	45	SSE	10	---	6.0	87	135	143	136	0	86	26	100	0	0	0	
Pensacola CO	76.4	61.5	69.0	100	27	Dec.	1221	90.41	7.61	Sept. 25	T	T	30	Apr.	83	84	59	74	7.9	SSE	57	W	8	64	5.7	123	91	151	121	0	70	36	47	0	3	0	
Tallahassee	78.9	57.8	68.4	102	25	Jan.	1268	61.00	3.27	Aug. 20	0	0	---	---	87	88	57	73	5.6	NE	---	---	---	---	5.8	105	109	151	115	0	68	43	64	0	10	0	
Tampa	81.4	64.0	72.7	97	27	Dec.	438	57.18	3.66	Mar. 21	0	0	---	---	87	86	58	75	9.7	E	45	N	23	68	5.8	98	139	121	117	0	86	28	59	0	0	0	
West Palm Beach	83.9	67.5	75.7	95	19	Jan.	175	71.15	3.05	Jan. 17	0	0	---	---	86	85	62	77	10.0	ESE	45	SE	11	---	6.1	81	142	142	137	0	91	10	95	0	0	0	
GEORGIA																																					
Albany	78.5	56.6	67.6	101	27	Dec.	1574	58.56	3.03	May 6	T	T	Dec. 14	83	84	52	66	4.5	NE	45	NW	1	---	---	122	102	141	129	0	71	20	90	0	13	0		
Athens	73.5	51.3	62.4	101	3	Dec.	2709	51.33	2.02	Jul. 5	T	T	Dec. 25	---	---	---	---	---	---	---	---	---	---	---	---	4.8	151	95	119	111	0	49	---	63	0	37	0
Atlanta	72.5	52.5	62.5	99	10	Dec.	2653	49.84	3.63	Dec. 3	1.4	1.3	10	79	83	55	64	9.7	NW	70	NE	10	59	5.3	137	93	135	118	1	45	28	54	0	31	0		
Augusta	76.9	51.7	64.3	101	3	Dec.	2295	44.00	2.66	Sept. 26	T	T	Dec. 14	87	50	69	6.4	SE	45	S	6	---	---	---	5.4	130	101	134	114	0	62	21	91	0	49	0	
Columbus	76.0	52.7	64.4	98	15	Dec.	2246	59.05	5.04	Apr. 30	T	T	Dec. 14	---	87	55	70	---	---	---	---	---	---	---	---	5.3	138	94	133	121	0	65	11	74	0	40	0
Macon	77.2	53.8	65.5	101	13	Dec.	2042	58.18	3.15	Apr. 10	T	T	Dec. 14	81	85	50	63	9.3	NW	50	SE	15	64	5.4	132	99	134	131	0	61	28	89	0	23	0		
Rome	74.4	48.0	61.2	102	10	Dec.	3081	57.06	3.94	Jan. 17	1.8	1.8	14-15	86	50	68	---	---	---	---	---	---	---	---	---	5.0	139	106	120	112	1	53	18	80	0	80	0
Savannah	77.6	55.8	66.7	103	1	Dec.	1631	55.25	3.62	Sept. 26	T	T	Dec. 8	86	86	55	73	8.5	SW	66	E	13	56	5.9	109	109	147	116	0	60	37	63	0	17	0		
Valdosta	79.5	57.3	68.4	100	21	Dec.	1316	60.61	4.24	Sept. 26	0	0	---	---	---	---	---	---	8.4	NE	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
IDAH0																																					
Boise	63.5	39.5	51.5	105	12	Dec.	5442	13.80	1.48	Jan. 17	18.8	6.6	Dec. 6	67	63	71	52	10.0	SE	57	NW	23	60	5.7	120	82	163	101	6	19	16	37	7	116	0		

See reference notes at end of table.



## ANNUAL CLIMATOLOGICAL DATA

Table 10—Continued

YEAR 1953

State and Station	Temperature				Degree days	Precipitation				Relative humidity				Wind				Percent of possible sunshine	Number of days				Max temp 90° and above	Min temp. 32° and below	Zero and below																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Averages		Extremes			Total	Greatest in 24 hrs	Snow, Sleet, Hail		1:30 a. E. S. T.	7:30 a. E. S. T.	7:30 p. E. S. T.	Average hourly speed	Prevailing direction	Speed	Direction	Date		Precipitation 0.1 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Daily maximum	Daily minimum	Monthly	Highest				Date	Lowest																	Date	Greatest in 24 hrs																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
IDAHO (Cont'd.)	64.7	41.8	53.3	104	Aug. 22	20	Dec. 15	0.64	23-24	1.5	0.9	Jan. 2	73	54	45	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	

See reference notes at end of table.

## ANNUAL CLIMATOLOGICAL DATA

State and Station	Temperature				Precipitation				Relative humidity			Wind				Number of days																	
	Averages		Extremes		Degree days	Total	Snow, Sleet, Hail		Relative humidity			Wind				Snow, Sleet, Hail	Thunderstorms	Heavy fog	Max. temp.		Min. temp.												
	Daily maximum	Daily minimum	Monthly	Hi/low			Date	Lowest	Date	1:30 a. m. to 7:30 a. m.	7:30 a. m. to 1:30 p. m.	1:30 p. m. to 7:30 p. m.	Average hourly speed	Prevailing direction	Fastest mile				Direction	Date		Percent of possible sunshine	Average sky cover	Clear	Partly cloudy	Cloudy							
															Greatest in 24 hrs.												Total	Greatest in 24 hrs.	Total	Speed	Direction		
MARYLAND (Cont'd)	86.1	42.8	54.5	101	Sept. 2	15	Feb. 2	47.49	37.66	2.00	30-31	14.0	5.0	Mar. 8	56	--	--	--	--	--	--	--	--	113	5	15	9	38	6	122	0		
Frederick																																	
MASSACHUSETTS	60.1	42.3	50.5	99	Sept. 2	5	Feb. 5	5774	59.55	2.57	29-30	49.2	9.3	Jan. 9	80	78	57	71	14.9	WNW	S	25	Nov.	123	138	132	10	15	130	12	20	97	0
Blue Hill Obs.																																	
Boston	61.5	45.6	53.6	100	Sept. 10	11	Mar. 11	4885	57.73	3.10	29-30	27.4	9.8	Jan. 8	73	72	55	65	12.8	SW	NE	Nov.	93	162	130	7	16	26	15	13	74	0	
Nantucket	57.4	44.9	51.2	86	Aug. 30	14	Feb. 14	5215	59.95	4.48	7-8	3.8	2.0	Feb. 12	87	83	72	85	12.8	WSW	NE	7	89	183	128	2	22	90	0	9	66	0	
Pittsfield	57.4	36.4	47.1	95	Sept. 2	1	5	6771	44.37	3.07	28-29	54.4	5.4	Jan. 3	--	--	--	--	--	--	--	--	--	111	149	138	17	28	36	11	38	154	0
MICHIGAN	51.4	38.3	45.9	99	Sept. 1	-1	Feb. 1	7215	28.18	1.86	11-12	49.9	7.7	11-12	78	78	64	70	10.4	--	42	SW	May	186	153	14	38	9	7	47	137	2	
Alpena CO																																	
Detroit	60.5	43.2	51.9	100	Sept. 3	8	1	5564	23.86	1.80	3-4	20.3	3.2	14	76	77	56	64	9.9	S	54	SW	10	182	133	4	31	9	20	27	102	0	
Detroit (Willow Run)	61.3	41.9	51.6	100	Sept. 2	5	18	5681	23.36	1.91	3-4	22.6	3.5	14	78	80	54	64	10.5	SW	50	W	25	188	123	8	34	22	30	26	117	0	
Escanaba CO	52.0	37.1	44.6	96	Sept. 1	-8	22	7639	28.74	4.83	Jul. 1	51.2	7.0	19-20	78	82	66	71	10.2	--	47	NW	30	166	122	14	35	7	1	60	150	7	
Grand Rapids CO	59.9	43.1	51.5	101	Jun. 20	7	1	5728	27.95	3.49	24-25	44.5	5.2	22-23	81	83	58	67	10.1	W	46	SW	23	195	131	19	43	3	23	33	105	0	
Lansing	59.1	40.2	49.7	97	Jun. 20	3	7	6181	22.82	1.27	Aug. 1	23.8	3.7	Dec. 8	81	82	59	66	11.6	W	72	NW	Oct.	172	150	10	45	18	21	35	128	0	
Marquette CO	51.8	37.2	44.5	96	Jun. 1	-7	1	7745	34.68	1.96	Jul. 1	114.4	10.3	25-26	--	75	62	69	8.4	--	35	SW	13	211	165	35	26	16	6	73	150	4	
Waukegon	58.1	40.5	49.3	97	Jun. 20	6	1	6218	27.78	1.59	24-25	43.1	4.9	9-10	--	91	63	69	---	---	---	---	Nov.	189	134	15	47	25	17	31	121	0	
Sault Ste. Marie	51.1	33.3	42.2	93	Sept. 1	-17	30	9379	31.76	1.48	30	101.8	7.8	5	47	86	70	78	9.3	WNW	40	W	3	206	149	34	37	36	3	70	169	19	
MINNESOTA																																	
Duluth CO	49.4	30.7	40.1	89	Aug. 26	-24	1	9175	37.48	2.57	5-6	67.8	6.8	3-4	83	85	65	70	12.3	NW	56	NE	10	175	118	21	43	58	0	95	180	34	
International Falls	49.4	26.5	38.0	92	Aug. 25	-38	16	9944	26.49	2.40	2	72.0	8.6	3-4	81	82	61	66	---	---	---	---	Dec.	191	156	21	37	14	4	106	199	53	
Minneapolis	56.4	37.4	46.9	98	Jun. 18	-15	16	7346	27.91	2.00	27	34.6	4.5	19-20	76	81	60	61	11.3	SSE	54	SE	3	157	113	12	37	8	15	77	151	18	
Rochester	56.4	34.8	45.8	97	Jun. 19	-18	6	7592	26.98	3.37	25-26	31.8	4.5	2	79	81	58	64	9.6	SSE	---	---	Jun.	169	109	8	50	19	20	69	168	20	
St. Cloud	54.2	32.5	43.4	94	Sept. 2	-24	17	8318	29.73	2.97	15	57.2	7.3	19-20	83	85	61	67	8.0	NW	46	W	19	140	116	11	35	19	14	89	174	39	
MISSISSIPPI																																	
Jackson	78.2	54.7	66.5	103	Jun. 19	20	24	1998	45.33	4.85	29	T	T	25	78	85	50	59	7.3	S	49	S	29	124	93	0	55	13	116	0	23	0	
Meridian	77.8	52.6	65.2	102	Jun. 19	16	19	2166	54.80	2.78	29	T	T	21	87	90	52	64	---	---	---	---	Dec.	123	100	0	52	10	102	0	42	0	
Vicksburg CO	76.3	57.4	66.9	99	Jun. 21	19	24	1821	54.96	8.73	29	T	T	14	--	--	--	--	8.5	---	49	SW	5	125	92	0	57	15	92	0	9	0	
MISSOURI																																	
Columbia	68.4	46.1	57.3	102	Jun. 19	-3	23	4448	25.12	2.71	3-4	14.8	6.2	1	69	76	49	53	10.5	SSE	57	NW	15	109	91	3	44	11	71	9	103	1	
Kansas City	68.5	48.3	58.4	104	Jun. 11	1	16	4357	20.93	1.49	Sept. 3	24.1	8.0	21-22	87	75	82	51	10.6	S	61	W	15	111	86	6	36	7	76	10	93	0	
St. Joseph	67.0	44.2	55.6	104	Jun. 18	-2	16	4966	21.81	1.59	Dec. 2-3	21.5	7.8	1	--	78	51	53	11.0	TS	64	S	21	108	84	5	47	11	67	17	123	2	
St. Louis CO	69.1	50.4	59.8	103	Jun. 19	5	23	3931	22.98	2.06	Oct. 4-5	9.8	6.1	1	68	75	50	53	11.3	SW	61	SW	10	116	83	3	30	5	79	7	70	0	
Springfield	69.2	47.2	58.2	101	Sept. 28	5	23	4176	25.21	2.61	May 26	4.6	1.0	23	73	80	54	56	13.1	SSE	65	N	26	121	84	1	34	13	74	10	93	0	
MONTANA																																	
Billings	61.8	38.5	50.2	103	Jul. 14	-1	15	5962	11.70	1.11	20-21	33.0	6.1	27-28	55	62	48	40	12.2	SW	66	NW	28	142	78	11	27	23	29	15	134	2	
Glasgow CO	58.3	32.6	45.5	99	Jul. 31	-25	15	7554	15.33	2.29	28-29	41.5	6.1	14-15	70	77	52	49	---	---	---	---	Dec.	166	97	13	31	9	25	44	176	18	
Great Falls	59.0	37.2	48.1	102	Jul. 13	-6	14	6444	20.75	3.20	24-25	45.6	8.1	27-28	58	65	46	43	15.4	SW	68	SW	30	163	83	17	23	5	15	20	134	5	
Havre CO	59.3	33.9	46.6	104	Jul. 14	-15	15	7015	14.02	1.49	24-25	36.0	2.8	9-10	--	--	51	48	8.5	TSW	50	SW	15	156	85	16	27	2	21	28	170	11	
Helena	59.4	34.0	46.7	99	Jul. 14	-7	3	6831	8.88	1.66	24-25	24.7	7.9	28	59	69	49	43	8.5	W	57	SW	12	169	84	6	29	8	17	14	167	4	

See reference notes at end of table.



Table 10—Continued

YEAR 1953

## ANNUAL CLIMATOLOGICAL DATA

State and Station	Temperature				Precipitation				Relative humidity				Wind				Number of days														
	Averages		Extremes		Degree days		Snow, Sleet, Hail		1:30 a. m. E. S. T.		7:30 a. m. E. S. T.		Average hourly speed		Fastest mile		Percent of possible sunshine		Average sky cover		90° and above		32° and below		Zero and below						
	Daily maximum	Daily minimum	Monthly	Highest	Date	Lowest	Date	Greatest in 24 hrs	Total	Greatest in 24 hrs	Date	Total	Greatest in 24 hrs	Date	Direction	Speed	Direction	Date	Percent of possible sunshine	Average sky cover	Clear	Partly cloudy	Cloudy	Precipitation 0.1 inch or more	Thunderstorms 1.0 or more	Heavy fog	Max temp	Min temp			
MONTANA (Cont'd.)																															
	Kalispell	57.3	34.1	45.7	97	Jul. 12	8	Jan. 7	7053	14.62	1.17	7-8	40.2	7.6	20-21	Mar. 28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Miles City	60.9	35.5	48.2	103	Aug. 24	-12	Feb. 6	6718	16.61	1.51	9	32.0	5.1	Mar. 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Missoula	59.0	34.4	46.7	105	Jul. 12	8	Feb. 10	6760	11.36	1.46	24-25	31.5	6.9	Feb. 28	S	5.8	NW	52	9	52	6.9	81	71	213	121	9	24	20	21	
NEBRASKA																															
	Grand Island	64.1	40.2	52.2	103	Jul. 1	-11	Jan. 16	5824	20.18	1.51	28-29	26.8	6.0	Nov. 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Lincoln CO	64.8	43.5	54.2	103	Jun. 18	-9	Jan. 16	5390	18.31	1.45	18-19	19.3	3.8	Feb. 1	69	76	51	53	9.5	1	5	56	NW	15	68	5.0	136	121	108	84
	Norfolk	61.8	38.5	50.2	105	Jun. 18	-19	Jan. 16	6448	19.50	1.91	7	24.2	3.7	19-20	Feb. 28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
North Platte																															
	Omaha	64.8	36.3	50.6	106	Jul. 1	-10	Jan. 21	6134	13.65	1.37	20-21	28.6	6.4	19-20	Feb. 28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Scottsbluff	64.4	42.5	53.5	105	Jun. 18	-10	Jan. 16	5545	18.43	1.88	19	17.6	4.0	15-16	Feb. 28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Valentine CO	61.2	37.3	49.3	101	Jun. 29	-11	Jan. 15	6474	19.64	1.52	28-29	40.7	9.0	19-20	Dec. 25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
NEVADA																															
	Elko	63.2	29.5	46.4	101	Jul. 7	-6	Dec. 25	6996	7.04	.73	17-18	29.3	6.0	3-4	Dec. 25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Ely	62.0	28.2	45.1	95	Jul. 7	-8	Dec. 25	7373	5.22	.57	1	20.4	3.2	3-4	Nov. 4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Las Vegas	80.3	51.5	65.9	113	Jul. 23	19	Dec. 24	2365	.56	.11	22	T	T	20	Feb. 28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Ninmucca																															
	Reno	66.6	31.8	49.2	98	Jul. 12	7	Dec. 23	5940	4.57	.58	28-29	9.2	2.4	Mar. 1	59	74	40	31	6.8	NW	49	SW	10	77	4.2	182	81	102	37	
	Winnemucca	66.0	31.0	48.5	100	Jul. 12	2	Dec. 30	6304	6.28	.51	3-4	9.0	2.5	Mar. 1	55	66	41	33	8.1	W	50	SW	19	76	4.9	143	102	120	67	
	Concord	60.5	36.0	48.3	98	Jul. 12	0	Feb. 14	6462	46.30	2.56	10	31.9	11.4	9-10	83	80	52	69	6.3	NW	43	NE	7	53	5.9	101	116	148	120	
NEW JERSEY																															
	Mount Washington	35.0	22.4	28.7	71	Jul. 18	-27	Feb. 1	13109	70.38	3.99	13-16	218.9	32.0	15-16	Feb. 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Atlantic City CO	62.8	50.3	56.6	95	Jul. 1	15	Dec. 18	3922	55.91	7.33	14	5.2	3.5	8	Mar. 14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Newark	64.6	47.1	55.9	105	Jul. 2	13	Dec. 18	4406	43.72	3.32	12-13	7.3	2.4	6	Nov. 6	75	53	64	9.3	SW	45	NNE	7	---	5.8	119	99	147	118	
NEW MEXICO																															
	Trenton CO	64.5	47.1	55.8	100	Jul. 2	15	Dec. 18	4336	48.15	2.84	23	11.6	4.2	6	Nov. 6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Albuquerque	71.0	44.5	57.8	102	Jul. 2	12	Dec. 22	4158	5.08	.62	22-23	15.0	3.5	20-21	43	54	33	28	9.1	N	58	S	28	78	3.3	214	103	48	40	
	Clayton	68.7	39.8	54.3	100	Jul. 24	1	Dec. 23	4855	10.43	1.39	18	16.1	7.5	9-10	Feb. 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
NEW YORK																															
	Roswell	77.7	44.1	60.9	107	Jul. 23	-3	Dec. 24	3278	8.24	1.04	17-18	6.5	3.2	23	42	57	29	24	11.6	---	---	---	---	---	---	---	---	---	---	
	Albany	60.6	39.6	50.1	100	Jul. 2	-2	Feb. 2	5978	42.08	2.12	5-6	48.3	14.9	Nov. 8	81	79	54	68	8.5	SSE	71	NW	15	51	6.4	83	108	174	134	
	Binghamton CO	61.5	41.3	51.4	100	Jul. 9	9	Mar. 2	5520	34.75	1.53	6	30.6	6.5	Nov. 7	80	82	59	69	11.4	NW	53	W	10	51	7.0	70	95	200	149	
New York																															
	Buffalo	58.9	41.8	50.4	98	Jul. 3	6	Feb. 2	5860	35.88	2.28	1	61.8	10.6	7-8	80	80	60	72	13.4	SW	69	SW	21	50	6.9	60	116	189	150	
	New York (Central Park)	64.6	49.7	57.2	102	Jul. 2	15	Feb. 2	4045	51.19	3.32	23	11.6	4.0	6	Nov. 7	71	53	63	11.1	---	---	---	---	---	---	---	---	---	---	
	New York (Central Park)	64.9	49.2	57.1	102	Jul. 2	14	Feb. 2	4097	45.20	3.61	12-13	7.6	2.2	6	Nov. 6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
New York CO																															
	Rochester	63.3	49.0	56.2	99	Jul. 2	14	Dec. 18	4213	46.26	3.41	12	7.5	3.7	Nov. 6	74	58	62	70	12.6	W	68	SW	13	60	5.5	119	113	133	115	
	St. Louis	59.6	41.0	50.3	100	Jul. 21	5	Mar. 2	5928	30.38	1.91	9-10	56.3	11.2	Nov. 6	84	84	59	72	10.4	SW	65	W	21	53	6.5	80	113	172	142	
	Syracuse	59.9	41.1	50.5	98	Jul. 21	3	Mar. 2	5154	29.72	1.68	30-31	80.2	8.1	17-18	Feb. 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	

See reference notes at end of table.

## ANNUAL CLIMATOLOGICAL DATA

State and Station	Temperature				Precipitation				Relative humidity				Wind				Percent of possible sunshine				Number of days				Max temp.		Min temp.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Averages		Extremes		Degree days	Total	Greatest in 24 hrs	Snow, Sleet, Hail		1:30a. P. S. T.	7:30a. P. S. T.	1:30p. P. S. T.	7:30p. P. S. T.	Average hourly speed	Prevailing direction	Fastest mile		Date	Percent of possible sunshine	Average sky cover sunrise to sunset	Sunrise to sunset		Snow, Sleet, Hail 10 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	Daily maximum	Daily minimum	Monthly	Highest				Lowest	Date							Total	Greatest in 24 hrs				Date	Total								Greatest in 24 hrs	Date	Speed	Direction																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

See reference notes at end of table.



## ANNUAL CLIMATOLOGICAL DATA

Table 10—Continued

YEAR 1953

State and Station	Temperature				Degree days	Precipitation			Relative humidity			Wind			Number of days																			
	Averages		Extremes			Total	Greatest in 24 hrs	Date	Snow, Sleet, Hail		Date	Relative humidity		Average hourly speed	Prevailing direction	Wind		Percent of possible sunshine	Average sky cover	Sunrise to sunset			Heavy log	Thunderstorms	Snow, Sleet, Hail	10 or more	Ol inch or more	Precipitation						
	Daily maximum	Daily minimum	Monthly	Highest					Lowest	Date		Date	Greatest in 24 hrs			Date	7:30a. E. S. T.			7:30p. E. S. T.	7:30p. E. S. T.	7:30p. E. S. T.							Speed	Direction	Fastest mile	Clear	Partly cloudy	Cloudy
PENNSYLVANIA (Cont'd.)																																		
Park Place CO	57.9	40.3	49.1	97	2	Sept. 2	6232	50.58	3.89	Sept. 6	Nov. 6	79	61	--	--	--	--	--	--	6.0	104	102	159	119	13	17	66	10	38	128	0			
Philadelphia CO	65.8	50.2	58.0	100	18	Aug. 18	3857	50.47	2.27	28-29	Nov. 7	77	51	63	7.5	NW	38	NW	38	61	6.0	104	116	145	135	5	34	14	35	5	49	0		
Pittsburgh	62.7	43.2	53.0	97	8	Sept. 8	5095	31.21	2.57	Dec. 9	Nov. 7	75	53	62	9.7	WSW	50	NW	50	55	6.6	74	112	179	132	9	45	19	16	105	0			
Reading CO	65.3	46.9	56.1	102	2	Dec. 16	4322	50.76	3.15	6-7	Nov. 6-7	--	74	--	--	9.9	NW	51	SW	36	5.9	107	104	154	118	6	42	9	33	6	67	0		
Scranton CO	61.7	42.9	52.3	100	3	Feb. 9	5293	35.26	2.17	Sept. 5-6	Nov. 6-7	--	53	--	--	6.3	--	32	SW	51	6.1	102	108	155	133	6	33	6	21	22	89	0		
Williamsport	63.3	41.3	52.3	102	3	Dec. 3	5324	34.06	2.25	23-24	Nov. 6-7	81	80	52	6.9	W	58	SSE	14	--	6.3	82	119	164	135	7	43	39	36	11	117	0		
RHODE ISLAND																																		
Block Island	58.8	46.1	52.5	87	13	Sept. 13	4897	54.70	4.86	14-15	Feb. 8	--	82	69	--	--	--	--	--	--	5.9	111	100	154	118	5	17	79	0	5	58	0		
Providence	61.9	43.5	51.7	99	2	Dec. 10	5017	58.57	3.71	22-23	Aug. 8-9	80	77	56	70	10.3	SW	*63	SW	59	5.8	109	105	151	118	8	14	32	12	9	85	0		
SOUTH CAROLINA																																		
Charleston CO	74.3	60.3	67.3	99	26	May	1511	44.03	3.14	13-14	Jun. 14	AP	AP	AP	AP	10.0	SW	65	N	1	67	5.7	119	101	145	117	0	61	21	35	0	5	0	
Columbia CO	76.1	55.2	65.7	102	1	Aug. 1	2031	38.72	4.31	26-27	Apr. 30	83	85	48	66	6.4	SW	47	SW	1	67	5.2	137	102	126	103	0	30	11	82	0	14	0	
Florence	76.7	53.0	64.9	102	3	Aug. 3	2143	40.09	2.65	7-8	Jan. 5	--	83	48	66	--	--	--	--	--	--	5.4	127	105	133	109	0	47	14	85	0	31	0	
Greenville	73.1	52.2	62.7	99	15	Dec. 31	2727	49.56	2.59	19-20	Feb. 2	75	78	49	61	7.9	NNE	56	E	1	67	5.0	142	104	119	110	0	47	30	68	0	33	0	
Spartanburg	72.8	51.3	62.1	98	7	Dec. 16	2776	41.32	1.97	20-21	Feb. 24	--	78	51	--	--	--	--	--	--	--	--	143	109	113	108	0	47	19	60	0	37	0	
SOUTH DAKOTA																																		
Huron	58.0	35.3	46.7	99	26	Aug. 26	7402	20.44	2.51	19-20	Jun. 20	79	84	60	61	11.4	SSE	68	NW	18	60	5.7	104	121	140	97	17	47	17	24	63	168	18	
Rapid City	61.3	38.6	49.0	100	31	Jun. 11	6423	16.25	1.74	19	Feb. 9-10	69	71	51	54	10.8	NNW	65	W	23	60	5.4	121	120	124	93	15	44	18	30	27	167	6	
Sioux Falls	58.3	35.6	47.0	101	18	Jan. 18	7317	30.05	2.87	27	Feb. 19-20	74	78	55	58	11.5	S	*50	SSE	*23	--	5.8	109	115	141	100	15	46	15	29	58	164	16	
TENNESSEE																																		
Bristol	69.5	45.9	57.7	98	1	Sept. 1	3862	34.39	1.59	28-29	Jun. 15	--	84	51	--	--	--	--	--	--	--	5.5	127	104	134	128	3	47	17	43	4	92	0	
Chattanooga	73.6	48.8	61.2	101	11	July 11	3127	47.60	2.43	20-21	Feb. 15	84	87	50	62	5.2	SSW	67	NW	11	60	5.2	130	114	121	104	1	45	34	75	1	71	0	
Knoxville	71.9	49.0	60.5	99	1	Sept. 1	3284	39.55	2.35	18	Feb. 14-15	77	82	52	58	7.2	NE	62	SW	30	58	5.2	136	102	127	118	3	36	19	63	3	67	0	
Memphis	74.4	52.2	63.3	103	20	Dec. 16	2868	53.38	3.31	20-21	Dec. 14	75	80	51	57	9.4	S	50	NW	11	70	4.9	152	97	116	89	0	45	11	98	1	34	0	
Nashville	72.7	49.3	61.0	102	1	Sept. 1	3280	41.31	2.69	6-7	Dec. 14	78	83	52	60	6.4	S	73	NW	13	63	5.2	140	93	132	103	1	52	13	78	3	68	0	
Oak Ridge	71.3	47.1	59.2	101	1	Sept. 1	3561	46.34	2.65	9	Feb. 14-15	--	--	--	--	4.3	W	--	--	--	--	5.0	149	96	120	110	3	42	30	60	2	83	0	
TEXAS																																		
Abilene	78.6	53.8	66.2	106	11	Aug. 11	2241	19.75	2.97	16-17	Jan. 16	59	68	41	40	12.8	SSE	71	S	26	71	4.0	200	66	99	47	1	34	4	121	2	33	0	
Amarillo	74.0	45.3	59.7	108	24	Dec. 7	3741	13.05	1.56	22	Jan. 22	58	67	39	38	12.3	SW	66	SW	10	79	3.8	190	104	71	52	2	53	28	105	4	96	0	
Austin	80.2	57.5	68.9	106	9	Aug. 23	1510	29.68	4.16	22-23	Apr. 24	76	84	52	54	9.6	S	47	W	2	66	4.8	153	97	115	82	0	36	20	124	0	13	0	
Brownsville	84.2	66.2	75.2	100	1	May 31	451	11.59	1.36	24-25	---	--	84	87	55	68	12.7	SE	46	S	15	65	5.3	124	127	114	56	0	25	20	139	0	1	0
Corpus Christi	82.9	63.5	73.2	101	9	Aug. 28	755	24.14	5.52	28-29	Feb. 22	84	88	59	70	12.3	SE	45	S	30	71	5.3	124	119	122	71	0	32	22	131	0	4	0	
Dallas	78.2	55.8	67.0	108	17	Dec. 17	2091	25.31	2.61	28	Jan. 23	70	81	54	53	9.9	S	48	S	11	66	4.3	183	81	101	68	2	27	6	121	1	23	0	
Del Rio	83.6	59.1	71.4	107	10	Dec. 17	1319	12.28	3.87	12	Jan. 31	57	72	45	37	7.8	ESE	49	SE	22	69	4.3	174	85	106	37	0	22	5	142	0	18	0	
El Paso	77.7	51.2	64.5	106	23	May 23	2461	4.42	6.1	12-13	Jan. 22	35	44	28	23	11.3	S	61	W	5	89	2.9	242	65	58	32	2	34	1	111	0	53	0	
Fort Worth	77.8	55.9	66.9	106	11	Dec. 16	2104	24.74	2.35	23-24	May 16	66	76	48	47	12.1	S	*43	WNW	22	--	4.2	182	80	103	73	1	37	7	116	1	16	0	
Galveston CO	75.6	65.7	70.7	94	2	Dec. 30	983	43.47	4.64	28-29	May 18	83	85	71	76	12.2	S	60	W	18	61	5.7	125	90	150	84	0	53	46	24	0	2	0	

See reference notes at end of table.

## ANNUAL CLIMATOLOGICAL DATA

Table 10-Continued

[illegible]

See reference notes at end of table.



## YEAR 1953

† Wind direction to 8 compass points only.

CO after station name indicates city office data, except where certain elements are from the airport, which are indicated by AP above each value.  
Also on earlier dates.  
Data entered in column headed "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic reading wind instrument.

# NORMALS, MEANS AND EXTREMES

Table 10a

State and Station	Temperature (°F)										Precipitation (inches)				Relative humidity (percent)				Wind Speed (m.p.h.)		Sunshine (percent of possible)		Annual mean number of days																			
	Normal					Extremes					Normal		Extremes		Normal		Extremes		January		July		Mean hourly		Fastest mile		January		July		Precipitation		Sunrise to sunset		Thunderstorms		Temperature					
	Daily		Monthly		Annual	Record high	Record low	Length, yrs.		Record high		Record low	Daily		Monthly		Annual	Record high		Record low	Daily		Monthly		Annual	Daily		Monthly		Annual	Clear		Partly cloudy		Cloudy		Snow, sleet, hail		Heavy fog		Max., Min.	
	January	July	January	July	January	July	January	July	January	July	January	July	January	July	January	July	January	July	January	July	January	July	January	July	January	July	January	July	January	July	January	July	January	July	January	July	January	July	January	July		
ALABAMA	610	55.5	34.9	90.2	69.0	62.5	58	107	-10	623	2780	6.31	2.71	53.52	26.12	0.00	8.84	1.0	1.9	11.0	81	61	67	84	56	68	8.2	5.4	65	45	62	132	116	117	118	**	67	5	59	38	**	
	211	62.2	43.2	89.4	72.0	67.3	12	104	11	416	1612	8.29	3.23	63.92	19.29	.05	6.52	T	T	T	88	63	77	90	65	78	-	-	-	-	65	137	127	121	129	0	27	70	15	0		
	198	59.7	38.7	91.3	71.0	65.4	81	107	-5	517	2137	6.50	2.36	53.66	20.10	T	9.98	T	T	T	89	61	77	85	54	60	-	-	-	-	51	117	118	115	**	54	7	68	20	**		
ARIZONA	6992	38.9	11.7	79.2	51.1	44.6	55	93	-30	1231	7525	2.60	53	18.47	8.77	.00	3.59	17.1	68.1	22.0	75	52	54	68	35	41	-	-	-	-	136	134	95	7	21	37	**	2	198	9	**	
	1114	64.3	34.5	90.5	75.1	61.4	58	116	16	1474	1698	1.00	.06	7.16	6.47	.00	4.98	T	T	T	71	40	38	52	29	33	4.3	5.7	65	76	93	228	90	47	36	0	27	**	169	25	**	
	5014	50.2	20.4	90.9	61.0	55.2	11	102	-5	921	4593	3.70	.23	15.98	9.61	.00	3.08	7.3	20.9	12.4	71	62	48	56	43	32	7.0	7.0	59	78	73	181	100	84	60	7	46	3	46	133	**	
CALIFORNIA	2558	63.1	36.3	99.4	73.0	67.6	110	16	474	1776	2.15	.21	10.66	4.31	.00	2.73	6.1	1.2	3.0	65	41	36	56	32	30	7.0	7.0	59	78	73	197	98	80	51	**	36	**	145	23	0		
	4380	46.2	19.2	92.6	61.8	55.0	22	104	18	1001	4702	1.62	.29	7.83	2.72	.00	1.47	2.5	8.2	6.0	73	49	42	61	30	8.1	9.0	-	-	-	177	97	91	52	**	32	**	68	135	3		
	199	67.2	43.3	107.7	81.5	74.7	78	123	22	318	951	.84	.01	3.39	6.25	.00	4.01	T	T	T	57	32	32	60	28	25	6.6	16.1	56	82	92	288	57	20	16	0	9	1	159	3	0	
ARKANSAS	458	50.6	29.4	94.2	20.4	62.0	72	113	-15	775	3188	5.06	2.56	41.56	15.02	.05	8.58	2.0	5.4	14.3	80	64	65	81	52	55	8.2	5.7	58	46	75	145	109	111	108	2	53	6	59	54	**	
	251	40.1	32.4	94.5	64.5	51.1	111	106	-3	600	2982	2.56	2.44	30.36	18.34	.04	6.55	1.7	1.9	4.3	86	67	71	89	56	58	8.3	5.3	61	46	71	138	102	102	136	103	1	67	17	82	39	**
	361	56.3	35.5	94.6	71.1	65.1	111	106	-3	600	2982	2.56	2.44	30.36	18.34	.04	6.55	1.7	1.9	4.3	86	67	71	89	56	58	8.3	5.3	61	46	71	138	102	102	136	103	1	67	17	82	39	**
COLORADO	489	57.3	36.3	101.1	67.3	65.0	57	118	13	561	2115	1.12	.01	6.36	4.61	.00	1.68	T	1.4	4.0	86	70	58	47	29	18	5.1	7.1	60	-	-	207	86	72	33	**	3	18	115	25	0	
	1108	53.6	22.2	96.9	54.1	56.0	130	109	-15	40	4222	1.12	.01	6.36	4.61	.00	1.68	T	1.4	4.0	86	70	58	47	29	18	5.1	7.1	60	-	-	207	86	72	33	**	3	18	115	25	0	
	5280	43.2	28.5	77.7	57.9	59.0	110	93	5	893	5719	9.47	.03	53.51	126.75	.00	8.66	62.2	13.4	9.0	48	41	20	16	-	-	-	-	-	-	190	95	80	26	4	16	**	101	143	**		
CONNECTICUT	699	65.2	39.8	87.3	59.0	62.2	122	111	21	356	1808	3.06	T	13.8	13.84	.00	7.76	4	5	4.7	70	54	46	83	30	42	4.5	5.5	45	-	-	172	68	125	90	42	11	71	1	109	0	
	333	53.5	30.9	80.0	64.1	63.0	96	118	17	629	2532	1.66	T	9.31	7.92	.00	2.86	1	1	2.5	91	73	67	52	28	16	6.7	6.8	56	39	50	185	102	128	38	**	4	36	47	6	0	
	312	64.6	43.4	83.2	61.7	63.9	109	28	32	1451	3.97	1.4	34	15.80	.09	7.36	T	2.0	2.0	2.0	94	85	78	67	52	28	16	6.7	6.8	56	39	50	185	102	128	38	**	4	36	47	6	0
DELAWARE	99	63.3	43.0	74.4	60.8	59.0	18	104	23	378	2015	2.75	T	12.37	8.14	.00	4.20	T	T	T	65	55	81	85	66	58	6.4	5.9	62	-	-	139	111	110	37	0	3	34	3	0		
	3343	41.4	24.1	84.8	49.5	45.3	11	101	-2	998	5913	5.39	.13	33.71	17.34	.00	4.70	31.5	97.8	37.4	85	77	77	70	36	28	6.3	6.0	8.3	-	-	156	194	115	91	16	12	10	19	135	**	
	3	56.0	38.4	72.0	63.4	56.5	25	102	23	552	3163	3.42	T	17.63	8.78	.00	3.21	T	1.0	3.5	73	68	88	69	63	60	8.3	-	-	-	138	126	101	64	**	2	20	4	90	16	0	
FLORIDA	25	52.1	39.8	99.2	68.6	60.9	76	114	17	614	2560	4.23	.02	21.57	10.71	.00	6.12	1.8	3.2	4.0	85	70	66	50	29	18	6.5	5.6	63	48	95	214	72	79	70	**	4	20	50	9	0	
	19	64.3	43.5	75.3	63.1	62.4	182	110	25	371	1574	2.57	T	10.86	9.26	.00	3.62	T	T	T	73	58	66	87	68	72	5.7	6.3	70	68	168	176	113	95	**	2	15	1	**	0		
	52	58.5	39.9	89.3	65.6	63.1	104	23	582	3069	4.07	.01	20.51	24.35	.00	4.57	T	T	T	86	58	68	90	71	69	6.9	6.1	63	53	68	163	108	96	62	0	2	22	1	**	0		
HAWAII	4517	46.0	33.6	85.1	62.7	59.3	22	162	3	781	4243	2.85	.02	12.42	11.12	.00	4.09	8.6	25.7	38.5	81	58	58	39	25	26	17.9	3.2	97	-	-	209	84	72	41	6	6	85	3	14	0	
	231	62.7	38.0	72.6	51.7	57.1	11	194	22	453	2934	2.71	.03	13.48	5.88	T	2.55	T	T	T	81	60	61	93	67	64	8.4	6.1	-	-	172	117	76	49	0	**	85	3	14	0		
	73	41.8	24.7	86.7	65.0	54.2	6	101	2	983	4910	5.28	2.98	44.50	7.40	.46	6.24	4.9	17.0	11.9	78	63	73	81	54	70	8.5	7.1	-	-	-	94	105	166	126	6	33	51	24	98	0	
ILLINOIS	7534	36.3	-2.5	81.3	46.8	41.4	9	91	50	1491	8659	1.10	.17	6.23	1.62	T	1.33	4.3	25.4	16.8	77	59	59	84	38	37	-	-	-	-	146	139	80	61	13	50	13	**	230	47		
	6175	40.9	16.6	84.8	57.6	49.1	6	97	27	1122	6254	2.72	.12	14.26	4.62	T	3.00	4.0	24.5	5.6	52	39	44	70	36	42	11.5	5.0	2.0	60	-	-	142	124	99	83	8	17	1	159	8	
	5292	41.7	15.6	87.2	58.3	49.8	82	105	29	1125	6132	2.20	.30	14.20	8.57	.00	6.53	6.1	56.2	23.0	58	42	46	31	33	7.7	7.0	65	57	68	152	132	90	74	0	3	50	132	5			
INDIANA	4793	44.9	13.8	88.3	59.9	51.5	63	104	31	1104	5709	1.61	.38	11.67	8.13	.00	2.93	4.2	28.8	16.3	66	44	48	68	32	35	8.0	7.8	60	75	74											



# NORMALS, MEANS AND EXTREMES

Table 10a - Continued

[illegible]

See reference notes at end of table.

## Table 10a - Continued

See reference notes at end of table.



# NORMALS, MEANS AND EXTREMES

Table 10a - Continued

[illegible]

See reference notes at end of table.

# NORMALS, MEANS AND EXTREMES

Table 10a - Continued

State and Station	Temperature (°F)										Precipitation (Inches)						Relative humidity (percent)						Wind Speed (m.p.h.)		Sunshine (percent of possible)	Annual mean number of days															
	Normal					Extremes					Normal		Extremes		January		July		Mean hourly	Fastest mile	Sunrise to sunset		Snow, sleet, hail 1.0 inch or more	Thunderstorms		90° and above	32° and below														
	January		July		Annual	Record highest	Record lowest	Seasonal	Wettest month	Driest month	Wettest year	Driest year	Maximum in 24 hours	Minimum in 24 hours	January	7:30 a.m. to 7:30 p.m.	7:30 a.m. to 7:30 p.m.	7:30 p.m. to 7:30 a.m.			January	July																			
	Maximum	Minimum	Maximum	Minimum																								Length, yrs.													
<b>TENNESSEE</b>																																									
Bristol	48.5	28.6	85.5	64.0	36.4	15	102	10	8.18	41.24	9.73	0.32	3.21	2.4	10.1	16.2	85	65	73	88	56	68	6.9	4.1	-	43	61	115	132	134	133	3	50	43	23	94	**				
Chattanooga	51.6	31.6	89.6	67.0	60.0	75	106	10	725	3384	3.05	2.69	53.60	15.29	1.04	6.51	2.2	6.0	12.6	79	62	58	83	56	67	7.6	5.9	7	42	61	120	123	134	133	3	59	27	38	50	**	
Knoxville	50.0	31.1	89.1	67.6	59.3	83	104	10	725	3384	3.05	2.69	53.60	15.29	1.04	6.51	2.2	6.0	12.6	79	62	58	83	56	67	7.6	5.9	7	42	61	120	123	134	133	3	59	27	38	50	**	
Memphis	50.3	32.9	91.1	71.3	61.8	81	106	11	725	3137	3.58	2.58	49.42	18.16	1.00	10.48	1.9	5.2	18.0	79	68	70	81	58	63	12.9	7.5	57	42	68	119	123	134	132	3	52	41	60	**		
Nashville	57.7	48.9	90.6	69.3	60.1	83	107	13	734	3513	3.28	2.52	45.03	14.75	1.03	8.55	2.6	4.6	17.0	84	66	72	81	54	61	9.7	7.3	73	42	68	129	103	133	133	3	56	30	42	84	**	
Oak Ridge	90.5	48.3	27.9	90.1	65.5	57.8	9	105	0	874	4028	6.06	2.42	45.03	14.75	1.00	3.33	2.2	5.3	6.5	84	66	72	81	54	61	9.7	7.3	73	42	68	129	103	133	133	3	56	30	42	84	**
Oak Ridge Area	88.6	48.6	28.2	90.0	65.1	37.8	9	103	1	822	4006	5.64	2.77	52.38	12.84	1.50	7.75	2.2	5.3	6.5	84	66	72	81	54	61	9.7	7.3	73	42	68	129	103	133	133	3	56	30	42	84	**
<b>TEXAS</b>																																									
Abilene	55.1	31.4	94.6	71.5	64.1	168	111	9	673	2657	3.68	1.88	22.55	15.70	1.00	6.78	1.4	3.8	8.0	73	50	55	74	39	40	10.4	9.8	109	59	77	157	110	98	68	41	**	93	42	**		
Amarillo	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
Austin	61.6	38.9	52.0	91.8	72.7	73.6	126	104	12	729	3617	6.27	1.20	29.50	10.57	1.00	11.91	3.7	9.7	8.8	66	72	79	50	47	10.9	10.3	110	47	86	125	125	113	80	4	33	16	95	4	0	
Brownsville	46.9	32.5	91.2	73.6	67.0	105	11	330	1011	4.70	1.20	29.50	10.57	1.00	11.91	3.7	9.7	8.8	66	72	79	50	47	10.9	10.3	110	47	86	125	125	113	80	4	33	16	95	4	0			
Corpus Christi	48.7	35.3	91.2	74.1	70.8	105	11	330	1011	4.70	1.83	28.00	15.89	1.00	8.26	1.7	5.0	8.0	72	62	79	50	47	10.9	10.3	110	47	86	125	125	113	80	4	33	16	95	4	0			
Del Rio	109.1	62.2	11.6	93.3	76.1	69.5	48	111	11	419	1407	4.97	1.83	34.42	13.04	1.00	8.38	1.2	2.4	7.1	80	62	72	80	48	10.4	9.8	109	59	77	157	110	98	68	41	**	93	42	**		
El Paso	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
Fort Worth	54.4	34.3	35.9	93.4	74.9	66.0	55	112	8	639	2438	4.92	1.88	33.69	17.64	1.00	9.37	1.1	2.5	8.2	73	61	81	73	48	10.3	9.8	109	59	77	157	110	98	68	41	**	93	42	**		
Galveston CO	47.9	39.8	32.1	87.1	78.0	70.1	83	101	8	336	1211	5.44	2.88	45.19	26.01	1.00	14.33	1.1	2.5	8.2	73	61	81	73	48	10.3	9.8	109	59	77	157	110	98	68	41	**	93	42	**		
Houston CO	61.6	38.9	52.0	91.8	72.7	73.6	126	104	12	729	3617	6.27	1.20	29.50	10.57	1.00	11.91	3.7	9.7	8.8	66	72	79	50	47	10.9	10.3	110	47	86	125	125	113	80	4	33	16	95	4	0	
Laredo	60.3	31.8	92.7	72.0	68.5	59.3	7	106	9	812	3587	3.16	1.53	18.39	17.62	1.00	10.83	1.1	2.5	8.2	73	61	81	73	48	10.3	9.8	109	59	77	157	110	98	68	41	**	93	42	**		
Marathon	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
Midland	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
San Antonio	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
San Diego	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
San Jose	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
San Marcos	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
San Antonio	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
San Antonio	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
San Antonio	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
San Antonio	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
San Antonio	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
San Antonio	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
San Antonio	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		
San Antonio	59.0	38.9	21.6	91.8	62.8	56.5	62	108	15	921	4343	3.25	1.62	21.12	9.81	1.00	6.73	3.6	19.0	20.6	73	52	54	76	41	42	11.8	11.1	84	59	77	142	119	144	144	106	101	3	0		



## Table 10a - Continued

# GENERAL SUMMARY OF TORNADOES IN THE UNITED STATES

## YEAR 1953

The year 1953 was record-breaking in regard to the number of tornadoes reported and the amount of property destroyed by them. The total of 516 deaths was high, being over twice the annual average, but this number was exceeded in 1925, 1927, and 1936. The number of persons receiving injuries (5,157) was also great. A total of 532 tornadoes was reported on 151 days during 1953. This total includes 80 funnel clouds reported as not reaching the ground, and 20 waterspouts, 6 of which reached land and caused property damage; but it does not include 2 whirlwinds that occurred under clear skies and caused \$5,000 damage each, nor a "fair weather" waterspout that caused \$500 damage. The year's total of 532 tornadoes was nearly twice the previous record of 300 in 1951 and over 3 times the annual average of 166. Eight of the 1953 tornadoes crossed States' boundaries, and two of them passed through 3 States. The property damage of \$224,345,900, considerably greater than that of any previous year, was slightly less than one-half of the combined total for all of the past 37 years. It is impossible to compare accurately this year's number of tornadoes with those of other years, because (a) the number of tornadoes reported depends largely on the number of observers reporting, and (b) in recent years more persons have been making these observations. Consequently, it is to be expected that with the present dense network a greater number of tornadoes are being reported than formerly. Further, since estimated losses are based on values at the time of occurrence, it is impractical to compare damages with those of previous years without corresponding adjustments for the change in price index. However, from a comparison of yearly records of severe-tornado frequency and intensity, concentration and spread of damage, and loss of life, it is clearly apparent that more really disastrous storms of this type did occur in 1953 than in any other year of record.

Of the 516 lives lost from tornadoes in 1953, 358 resulted from 4 disasters: (1) in the vicinity of Flint, Mich., on June 8, when 116 persons lost their lives; (2) at Waco, Tex., on May 11, when the death toll reached 114; (3) in Worcester, Mass., and vicinity on June 9, when fatalities totaled 90; (4) and at Vicksburg, Miss., on December 5, when total deaths numbered 38.

Tornadoes occurred in 36 States during the year: 62 in Oklahoma, of which at least 5 were funnel

clouds that failed to reach the ground; 52 in Kansas, of which 22 were funnel clouds sighted aloft; 51 in Nebraska, of which 4 did not reach the ground; and 49 in Texas, of which 16 remained aloft. In Nevada, where only one tornado had been reported in the past 37 years, 5 occurred during 1953, all of them funnel clouds causing no damage. None were reported in the District of Columbia, Alaska, the West Indies, or the 12 States of Arizona, Connecticut, Delaware, Idaho, Kentucky, New Jersey, New Mexico, New York, Oregon, Rhode Island, Washington, and West Virginia.

May, usually the month of maximum occurrence of these storms, was exceeded by June during 1953, when 136 were reported. May followed with 120, then April with a total of 53, and July with 50. October reported the season's least number, 7.

June, with \$96,504,300 damage, ranked first among the months of 1953 in property destruction, owing mainly to the Worcester, Mass., Flint, Mich., and Cleveland, Ohio, tornadoes. (The 38-year damage average for June is \$2,600,000.) May was next with a little over \$55,000,000, the Waco, Tex., storm being responsible for over \$41,000,000 of the damage. April was in third place with \$39,756,500, \$35,000,000 of which was caused by the tornadoes in Alabama and Georgia on the 18th and 30th. December, which is usually in eleventh place, was fourth during 1953, with a total damage of \$26,596,800, caused principally by the Vicksburg, Miss., disaster. The month of September experienced the least property destruction, amounting to \$7,000.

Massachusetts, which had suffered a total property damage of only \$1,500,000 from the 18 tornadoes that occurred there during the period 1916 through 1952, was the hardest hit State in this respect in 1953, with property loss estimated at nearly \$53,000,000. Texas followed with over \$45,000,000 loss, and in Georgia the damage of \$30,722,600 placed that State in third place. Losses also exceeded \$20,000,000 in Mississippi (\$26,909,000), Michigan (\$23,313,400) and Ohio (\$20,029,100). In Nevada and Utah tornadoes were reported, but they either remained aloft or struck in open country with little or no property damage.

Fifteen tornadoes caused property losses of \$1,000,000 or more each in 13 States during 1953, and in 7 of these cases the losses equaled or exceeded 15 million dollars:

PLACE	DATE	DAMAGE	DEATHS	INJURIES
Worcester, Massachusetts	June 9	\$52,193,000	90	1,288
Waco, Tex.	May 11	41,150,000	114	597
Vicksburg, Miss.	December 5	25,000,000	38	270
Cleveland, Ohio	June 8	20,000,000	17	400
Alabama and Georgia	April 18	20,000,000	8	495
Flint to Lakeport, Mich.	June 8	19,000,000	116	867
Warner Robbins, Ga.	April 30	15,000,000	18	300
Illinois and Indiana	April 9	3,250,000	3	22
San Angelo, Tex.	May 11	3,239,000	11	159
Hebron to Milford, Nebr.	May 9	2,500,000	5	62
St. Clair County, Mich.	May 21	2,500,000	2	68
Iowa, Minnesota, & Wisconsin	May 10	1,500,000	2	29
Iowa	June 7	1,350,000	0	0
Iowa and Minnesota	May 10	1,035,000	6	6
Wisconsin	May 10	1,000,000	4	27



# GENERAL SUMMARY OF TORNADOES IN THE UNITED STATES—Continued

YEAR 1953

Eighty-five percent of the 525 tornadoes on which the time was reported occurred between noon and midnight, the greatest frequency being between 3 and 4 p.m. Two hundred and seventy-two, or 51 percent, occurred between 3 and 8 p.m. which is practically the same as the 38-year average. The hour of least frequency in 1953 was 5 to 6 a.m.

Following the usual pattern, the prevailing direction of the 1953 tornadoes was from the southwest to the northeast, with an average of about 65 percent traveling in that direction. Nearly 15 percent moved from west to east and about 8 percent from the northwest to southeast, making a total of approximately 88 percent coming from a general westerly direction. See the tornado rose for 1953

presented in Figure 1.

The longest tornado path of the year started in Vernon Parish, La., and extended northeastward to Washington County, Miss., on March 22, making a total length of 220 miles. Two other long paths occurred, one on May 10 which began in northern Iowa, crossed the southeastern corner of Minnesota, and extended into Wisconsin, reaching a total length of about 154 miles. The other long path (144 miles) began in Illinois on April 9 and extended nearly across Indiana. The shortest reported path was 200 feet in Mobile, Ala., on March 18. The average length of tornado paths reported during 1953 was about 15 miles and the average width 278 yards.

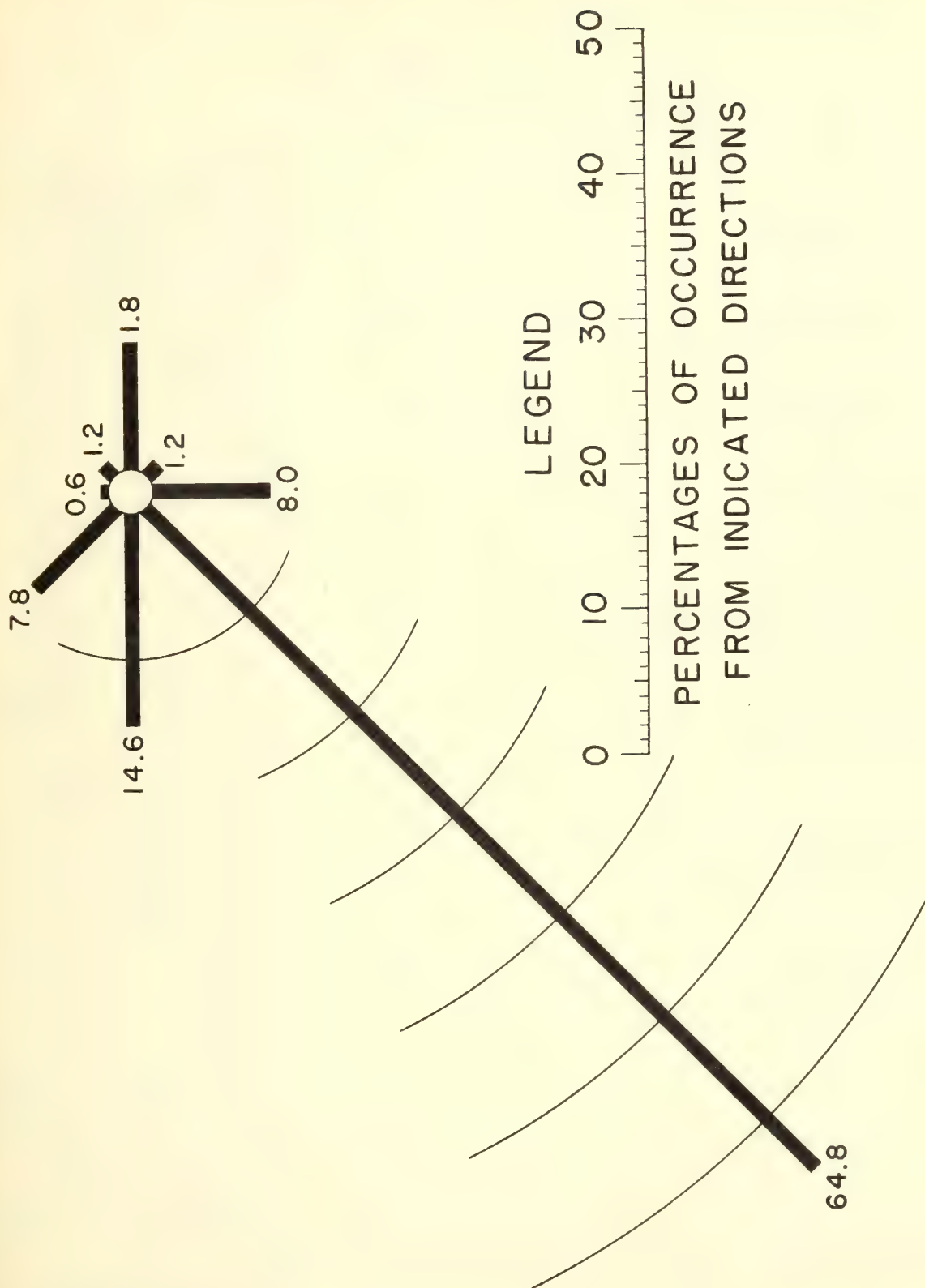


Figure 1.--Tornado rose for the United States, giving the percentage of tornadoes moving from the indicated directions during 1953.



# TORNADO DATA

Table 11

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
ALABAMA										
1. Jan. 8	6:30 a.m.	Dallas	NE	1/2	165	0	0	\$6,000	0	In Valley Creek, 12 miles north of Selma 1 residence demolished and contents destroyed; 1 garage collapsed on automobile; 1 residence and 1 outbuilding damaged.
2. Jan. 8	7:10 a.m.	Talladega	NE	4	800	0	0	5,000	0	Occurred in vicinity of West Talladega. Roofs on 20 buildings damaged. Trees blown down on telephone and power lines.
3. Jan. 20	3 p.m.	Walker	NE	1 1/2	50	0	0	5,000	0	Occurred near Cordova. Several residences severely damaged; several outbuildings and barns damaged.
4. Jan. 20	4:30 p.m.	Blount	NE	(1)	(1)	0	1	25,000	0	Storm occurred in St. Stephens Lock No. 1 section. 3 residences completely wrecked; 9 outhouses blown away; over 30,000 feet of timber destroyed. Some poultry killed. 1 automobile destroyed and 2 damaged.
5. Jan. 23	5 a.m.	Clarke	NE	6	300	0	1	39,000	0	
6. Feb. 20	4:10 p.m.	Colbert	NE	2/100	17	1	8	20,000	0	Occurred in Wheeler Mountain community 5 miles southwest of Tuscumbia. 1 residence destroyed and 6 damaged; 4 other buildings destroyed and 7 damaged.
7. Feb. 20	4:30 p.m.	Marion	NE	1/2	300	0	2	17,000	0	Occurred near Winfield. 7 residences destroyed and 5 damaged; 11 other buildings destroyed and 2 damaged.
8. Feb. 20	4:45 p.m.	Walker	NE	3/4	100	0	1	33,000	0	Occurred in Macedonia community, 10 miles north-northwest of Jasper. 5 residences destroyed and 2 damaged; 24 other buildings destroyed and 3 damaged.
9. Feb. 20	7 p.m.	Franklin	NE	6 to 8	220	0	6	25,000	0	Occurred near Vina. 10 residences destroyed and 39 damaged; 30 other buildings destroyed and 46 damaged.
10. Mar. 18	2:22 p.m.	Mobile	NE	2/67	(3)	0	2	15,000	0	Occurred at Mobile. Hailstones 1/2 to 3/4 inch in diameter. Tornado apparently just touched ground in one small area. 2 residences destroyed and 7 damaged.
11. Mar. 22	6:45 p.m.	Lauderdale	NE	1	(1)	0	0			Occurred 6 miles west of Florence; church blown down and several buildings damaged west of Florence. Hail accompanied storm. Damage included in storm # 12.
12. Mar. 22	7 p.m.	Lauderdale	NE	(1)	200	0	0	23,000	0	Occurred at Sky Harbor Airport, 10 miles northeast of Florence. Hail accompanied storm. Concrete block wall of hangar destroyed and part of roof blown away; 2 light aircraft and other equipment damaged beyond repair. See # 11.
13. Apr. 6	3:45 p.m.	Jefferson	ENE	1/2	34	0	12	10,000	0	Occurred at Bessemer. 2 outbuildings destroyed; a few others damaged.
14. Apr. 12	3:40 a.m.	Blount	NE	1/2	100	0	0	32,000	0	Occurred 12 miles south of Garden City. In rural area 1 building destroyed and 2 damaged.
15. Apr. 18	P.m.	Shelby	ESE	(1)	(1)					Occurred in well-populated area near Siluria. Damage, deaths, and injuries included with storm #16.
*16. Apr. 18	P.m.	Lee	ESE	(1)	(1)	6	195	5,000,000	0	Occurred in well-populated area near Auburn; crossed into Georgia; see #15.
17. May 1	5:15 p.m.	Chilton	ENE	1 1/2	110	0	2	50,000	0	Occurred in Manooka community, 3 or 4 miles south of Calera. 3 houses destroyed and 6 damaged; 6 barns destroyed.
18. May 1	7:30 p.m.	Clay	ENE	25	440	7	12	200,000	0	19 homes destroyed and 50 damaged; 36 other buildings destroyed and 57 damaged. Chickens killed, stripped of their feathers. Moved north of Millerville to south of Lineville.
19. May 1	P.m.	Jefferson	(1)	(1)	(1)	0	0	10,000	0	Occurred at Trussville, 17 miles northeast of Birmingham. 5 homes destroyed, 1 other building destroyed and 1 damaged.
20. May 1	P.m.	Choctaw	(1)	(1)	(1)	2	3	12,000	0	2 homes destroyed and 1 damaged.
21. May 4	6:30 p.m.	Marion	(1)	1/5	67	0	2	5,000	0	Near Winfield. 1 house and 5 other buildings destroyed.
22. May 4	7 p.m.	Jefferson	NE	(1)	(1)	0	0	0	0	Near Bessemer. 1 person observed funnel-shaped cloud which roared, was red, yellow, and black, and moved along Warrior River.
23. Aug. 16	Noon	Mobile	WNW	(1)	(1)	0	0	0	0	3 waterspouts observed near Alabama Port.
24. Aug. 16	Noon	Mobile	WNW	(1)	(1)	0	0	0	0	
25. Aug. 16	Noon	Mobile	WNW	(1)	(1)	0	0	0	0	
26. Dec. 6	7 to 8 a.m.	Henry	NE	(1)	(1)	0	0	7,000	0	Occurred in Napier Field vicinity, about 10 miles north of Dothan. Funnel-shaped cloud described as being black as night.
27. Dec. 6	8 a.m.	Henry	NE	2	(1)	0	1	10,000	0	15 homes damaged at Headland.

See reference notes at end of table.

# TORNADO DATA

Table 11--Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
ARIZONA										
(None reported)										
ARKANSAS										
1. Jan. 7	8:15 p.m.	Cleveland	ENE	4	100	0	2	3,000	0	Struck Macedonia area. Several houses damaged, 2 extensively. 2 barns damaged; several small out-buildings destroyed.
2. Feb. 20	10:15 a.m.	Prairie	NE	(1)	35	0	0	1,000	0	Funnel-shaped cloud dipped to ground briefly in southeastern part of town of Hazen. Damage to roofs, small buildings, and trees.
3. Mar. 14	12:30 a.m.	Logan and Johnson	NE	42	880	0	0	37,500	0	First struck Chismville in Logan County and skipped over path northeastward to point 5 miles north-east of Clarksville Airport. 5 houses and 1 church destroyed in Chismville area. 4 hangars and 3 airplanes destroyed at Clarksville Airport. Damage to tile factory at Clarksville.
4. Mar. 14	12:30 a.m.	Stone and Izard	NE	24	300	0	0	61,000	0	First struck near Newnata in Stone County and moved northeastward to Myron in Izard County. Principal damage in Belleview, La Crosse, Franklin, and Myron areas of north-eastern Izard County. 22 houses destroyed or badly damaged; 3 barns destroyed.
5. Mar. 14	1:30 a.m.	Yell and Pope	NE	22	880	0	7	145,500	0	First struck east of Delaware in Yell County and moved northeastward through Bunker Hill and Mill Creek communities to Dover in Pope County. The Bunker Hill and Mill Creek areas were the hardest hit. 18 houses destroyed, 56 damaged; 2 barns and many outbuildings destroyed.
6. Apr. 23	7 p.m.	Crawford	(1)	(1)	880	0	0	10,000	0	Funnel cloud observed by many persons at Alma. Many buildings, including a new brick structure, destroyed.
7. Apr. 24	4 a.m.	Miller	NE	1	100	0	0	5,000	0	Storm struck College Hill section of Texarkana. Considerable damage to houses, trees, and automobiles.
8. May 10	12:10 p.m.	Pope	NE	3	200	0	0	10,000	0	Several persons reported observing 2 funnels traveling parallel paths and merging into one just before reaching the city of Russellville. Portable roller rink destroyed and several buildings damaged.
9. July 20	2:30 p.m.	Desha	(1)	(1)	(1)	0	0	(4)	0	Several persons in the Jefferson community watched a funnel cloud demolish an old log barn. No other damage reported.
*10. Dec. 5	6-6:35 p.m.	Ashley	NE	55	500	0	0	164,500	2,500	This tornado was first reported near Spencer, La. It lifted to the north-east of town, then again touched ground 6 miles south of Arkansas line, just north of Beekman, La. Storm remained on ground across Ashley County, Ark. to point 5 miles northeast of Montrose, where it apparently dissipated. Extensive damage to timber for lumber and pulp wood in heavily forested area in its path. 4 houses destroyed and 6 damaged in Ashley County; crop damage principally to remnant cotton.
CALIFORNIA										
1. Apr. 27	1:15-1:30 p.m.	Stanislaus	(1)	(1)	(1)	0	0	7,000	0	Occurred north and west of Modesto; demolished 32-stanchion dairy farm, damaged other structures, and uprooted trees. Twister was erratic passing over some districts without damage. Power lines broken in 3 places.
2. May 19	1:30 p.m.	Glenn	NW	2	(1)	0	0	5,000	0	Freak "twister" or whirlwind occurred under clear sky; damaged automobile plant and lifted roof from another building at Orland.
3. June 28	2:30 p.m.	San Joaquin	(1)	(1)	(1)	0	0	5,000	0	Severe whirlwind occurred under clear sky. Truck driver reported seeing dark, twisting, funnel-shaped cloud,

See reference notes at end of table.



## TORNADO DATA

Table 11—Continued

YEAR 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
COLORADO										
1. June 7	P.m.	Sedgwick	SE	(1)	(1)	0	0	1,500	0	making a noise like a jet plane diving, which dipped nearby and sucked a 50- by 75-foot building 20 feet into air; then lower part of building twisted and dropped to ground; roof continued up until it hit high tension wires breaking lines before it dropped; short circuit caused a minor fire. Occurred at Stockton.
2. June 7	P.m.	Sedgwick	SE	(1)	(1)	0	0	0	0	Five small twisters during afternoon, only 1 caused any damage, at Julesburg.
3. June 7	P.m.	Sedgwick	SE	(1)	(1)	0	0	0	0	
4. June 7	P.m.	Sedgwick	SE	(1)	(1)	0	0	0	0	
5. June 7	P.m.	Sedgwick	SE	(1)	(1)	0	0	0	0	
6. June 17	1-2 p.m.	Conejos	(1)	1	1,500	0	0	200	0	
7. July 2	1:25-1:45 p.m.	El Paso	SW	(1)	(1)	0	0	0	0	Cyclonic surface wind, no funnel observed. Occurred at Antonito.
8. July 2	7-8 p.m.	Phillips	SW	(1)	(1)	0	0	(5)	0	Funnel cloud observed between Palmer Lake and Monument. Accompanied by heavy hail and rain.
9. July 16	1 p.m.	Summit	(1)	(1)	(1)	0	0	0	0	Funnel cloud observed, touched ground northwest of Holyoke.
10. July 16	1 p.m.	Clear Creek	(1)	(1)	(1)	0	0	0	0	2 funnel clouds observed on Torrey's Peak; 1 on western slope, the other on eastern slope of Continental Divide in Summit and Clear Creek Counties.
11. Aug. 16	5-5:30 p.m.	Otero	(1)	(1)	(1)	0	0	(4)	0	See above.
12. Aug. 17	2:30-3 p.m.	Adams	(1)	6	100	0	0	0	0	Twister struck 7 miles north of Fowler, damaging barn and several power poles.
13. Aug. 17	3-3:02 p.m.	Douglas	E	2	100	0	0	18,000	2,000	Near Bennett. Path in uninhabited area.
14. Sept. 17	2:05-2:06 p.m.	Boulder	SE	2 100	50	0	0	3,000	0	Occurred at Boulder.
15. Oct. 20	10:20-10:45 a.m.	Crowley	NE	2	200	0	0	4,000	0	Near Ordway. Accompanied by hail.
16. Oct. 20	10:45-10:55 a.m.	Otero	NE	10	900	0	0	15,000	0	At Fowler. Buildings, trees, and transmission lines damaged.
CONNECTICUT										
(None reported)										
DELAWARE										
(None reported)										
DIST. OF COLUMBIA										
(None reported)										
FLORIDA										
1. Jan. 9	Early a.m.	Hernando	NE	1/2	(3)	0	0	7,000	0	4 1/2 miles west of Brooksville. Major damage to home; small barn destroyed.
2. Jan. 9	7:10 a.m.	Hillsborough	NE	10	100	0	12	40,000	0	Moved from Lithia to Hopewell. 4 homes destroyed; 16 damaged.
3. Jan. 9	7:15 a.m.	Lake	NE	(6)	(3)	0	0	(4)	0	Between Clermont and Minneola. 1 home damaged.
4. Mar. 21	9 a.m.	St. Lucie	E	(1)	(1)	0	0	0	0	At Ft. Pierce. Funnel cloud above ground.
5. Mar. 21	11 a.m.	St. Lucie	W	(1)	(1)	0	0	0	0	At Ft. Pierce. Funnel cloud above ground.
6. Mar. 21	11:30 a.m.	St. Lucie	(1)	(1)	(1)	0	0	0	0	At Ft. Pierce. Waterspout dissipated over river.
7. Apr. 6	(1)	Bay	(1)	(6)	(3)	0	0	(5)	0	Occurred at Panama City. Shattered 45 feet of concrete block wall of a baseball park.
8. Apr. 12	Early a.m.	Bay	(1)	(1)	(3)	0	0	(4)	0	Major damage to Youngstown railroad station; several roofs damaged.
9. Apr. 13	8:45 a.m.	St. Lucie	E	2	(3)	0	0	(4)	0	South of Ft. Pierce. 1 home damaged; 2 garages unroofed.
10. May 4	(1)	Palm Beach	N	12	(1)	0	0	0	0	Waterspout near Boca Raton.
11. May 19	7:30 p.m.	Escambia	NE	2 100	17	0	0	3,000	0	Occurred at Warrington; damaged small skating rink and several homes.
12. June 4	4:30 p.m.	Dry Tortugas Island	(1)	(1)	(1)	0	0	(5)	0	Small waterspout passed over Dry Tortugas.
13. June 5	9:45 a.m.	Pinellas	(1)	(6)	(3)	0	0	(5)	0	Struck northern part of St. Petersburg. Moved small building 125 feet and scattered stacked lumber.
14. June 18	4 a.m.	Pinellas	E	(6)	(3)	0	0	5,000	0	Waterspout moved inland at Redington Beach; destroyed 1 home.
15. June 21	(1)	Pinellas	(1)	(1)	(1)	0	0	0	0	Waterspout drifted along beach at Indian Rocks.

See reference notes at end of table.

## TORNADO DATA

Table 11--Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
FLORIDA (Cont'd)										
16. June 21	Late p.m.	Pinellas	S	(1)	(1)	0	0	0	0	Waterspout in Tampa Bay. Just missed St. Petersburg.
17. July 24	2 p.m.	Orange	SW	100	17	0	1	(5)	(5)	Barn unroofed; trees broken at Taft.
18. Aug. 5	(1)	Broward	(1)	(1)	(1)	0	0	0	0	Funnel cloud northwest of Ft. Lauderdale.
19. Aug. 5	(1)	Dade	(1)	(1)	(1)	0	0	0	0	Funnel cloud west of Miami Airport.
20. Aug. 10	3:30 p.m.	Clay	SE	1	65	0	0	(5)	0	Minor damage to 2 homes; trees broken 40 to 50 feet above ground. Occurred at Orange Park.
21. Aug. 17	3:30 p.m.	Orange	(1)	(1)	(1)	0	0	0	0	Funnel cloud southwest of Orlando Airport.
22. Aug. 17	(1)	St. Lucie	(1)	(6)	(3)	0	0	(5)	(5)	10 miles west of Ft. Pierce. Slight damage to buildings and citrus trees.
23. Aug. 21	(1)	Palm Beach	(1)	(1)	(1)	0	0	0	0	Funnel cloud west of West Palm Beach.
24. Aug. 24	(1)	Palm Beach	(1)	(1)	(1)	0	0	0	0	Funnel cloud west of West Palm Beach.
25. Sept. 19	Late p.m.	Monroe	(1)	(1)	(1)	0	0	0	0	3 waterspouts near Tavernier.
26. Sept. 19	Late p.m.	Monroe	(1)	(1)	(1)	0	0	0	0	
27. Sept. 19	Late p.m.	Monroe	(1)	(1)	(1)	0	0	0	0	
28. Sept. 20	1 p.m.	Dade	(1)	(1)	(1)	0	0	0	0	10 miles northeast of Miami Airport.
29. Sept. 20	3:30 p.m.	Flagler	(1)	(1)	(1)	0	0	0	0	Waterspout off Flagler Beach.
30. Sept. 22	1 p.m.	Brevard	W	1	200	0	0	0	0	5 miles northwest of Melbourne, over marsh.
31. Oct. 9	9 a.m.	Lee	NW	5	25	0	0	3,000	0	Occurred at St. James City, near Ft. Myers. Associated with tropical storm.
32. Nov. 8	6 p.m.	Dade	(1)	(1)	(1)	0	0	(4)	0	6 miles southwest of Miami Airport.
33. Nov. 22	8:20 a.m.	Bay	(1)	(6)	(1)	0	22	20,000	0	20 miles northwest of Panama City in Woodville community. 5 homes destroyed.
34. Dec. 6	Noon	Leon	(1)	(1)	(1)	0	0	(4)	0	Buildings, autos, and trees destroyed 10 miles north of Tallahassee.
35. Dec. 10		Palm Beach	(1)	(1)	(1)	0	0	0	0	Funnel cloud northwest of West Palm Beach Airport.
36. Dec. 13	6 p.m.	Duval	ENE	5	100	0	0	160,000	0	10 miles east of Jacksonville. Path not continuous. Damaged homes and skipped to small airport where it destroyed a hangar and several planes.
37. Dec. 21	3:30 a.m.	Bay	N	(6)	(1)	0	0	(4)	0	5 miles west of Panama City. Waterspout, moving inland, damaged 3 beach cottages.
GEORGIA										
1. Jan. 20	8 p.m.	Harris	NE	(1)	(3)	0	1	6,000	0	Occurred near Cataula; 1 home and 3 smaller buildings demolished; several other buildings and timber damaged.
2. Jan. 20	9:30 p.m.	Tift	ENE	9	200	0	1	6,600	0	Moved from Zion Hope to Harding, destroying 2 homes and several barns at Zion Hope and causing moderate to severe damage to tourist camp near Tifton.
*3. Apr. 18	6:15 p.m.	Muscogee	ESE	(1)	400	2	300	15,000,000	0	Violent tornadic outbreak along advancing severe squall line that followed a general path from about Auburn, Ala. to Montezuma, Ga. Storm crossed State line from Phenix City, Ala., and through northern part of Columbus, Ga. Terrific winds, estimated at 100-150 m.p.h., demolished 499 homes and more than 100 other buildings; heavily damaged 2,000 or more homes and other buildings; affected 2,800 families. Extensive moderate damages occurred, and utility lines severely damaged and services knocked out.
4. Apr. 18	6:30 p.m.	Macon	E	(1)	200	0	1	75,000	(4)	Storm struck in area of Montezuma Airport, demolishing hangar building, 3 homes, and 8 other buildings, with moderate to heavy damages to 75 other homes and smaller buildings.
5. Apr. 18	6:45 p.m.	Marion	E	(1)	400	0	2	150,000	10,000	Occurred near Buena Vista; 10 homes and 40 other buildings demolished, with moderate to heavy losses to 45 other homes and smaller buildings. Considerable amount of stored crops blown away.
6. Apr. 30	3 p.m.	Marion	ENE	(1)	(1)	0	3	10,000	(4)	Affected small area near Buena Vista; numerous trees and utility lines blown down; 1 home destroyed and another heavily damaged; several other buildings damaged.
7. Apr. 30	5:10 p.m.	Peach	ENE	1	100	0	2	15,000	3,500	Occurred 2 miles south of Fort Valley; 3 homes destroyed; 1 home and several smaller buildings heavily damaged. Numerous trees blown down, including a group of pecan trees.

See reference notes at end of table.



# TORNADO DATA

Table 11-Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
GEORGIA(Cont'd.)										
8. Apr. 30	5:12 p.m.	Houston	ENE	(1)	300	18	300	15,000,000	(5)	Wide-bottom funnel observed at close range. Storm moved from Macon City Farm through Warner Robbins Air Base, leaving terrible scene of destruction. Winds, estimated to have exceeded 100 m.p.h., demolished 559 homes and apartment units, with heavy to total destruction to many other buildings and structures. Air made thick with debris. Heavy hail as large as golf balls accompanied storm.
9. Apr. 30	5:30 p.m.	Twiggs	ENE	(1)	(1)	1	3	10,000	0	Subsidiary storm, closely related to No. 8. Occurred near Dry Branch, where a church was demolished with heavy damage to house porch and an automobile.
10. Apr. 30	5:30 p.m.	Twiggs	ENE	(1)	(1)	1	2	300,000	0	Subsidiary storm, closely related to No. 8. Moved over short distance in rural area near Jeffersonville, demolishing 4 homes and heavily damaging 11 homes, several smaller buildings, and much timber.
11. Apr. 30	6:40 p.m.	Bibb	NE	5	200	0	0	100,000	0	Occurred in extreme southern part of County, moving from near Walden to a little beyond Softe. A church, several homes, and a number of other buildings heavily damaged or demolished, and many trees and utility lines blown down.
12. Dec. 4	5:30 p.m.	Cobb	NE	2	100	0	0	36,500	0	Funnel cloud observed, dull roaring sound changing to shrill whistling sound. Storm struck first in Bethel community, causing moderate damages mostly to house roofs, then moving across Parkaire Airport, where 3 hangar buildings and 20 or more airplanes heavily damaged.
IDAHO										
(None reported)										
ILLINOIS										
1. Mar. 14	8:15 p.m.	Washington, Jefferson, and Marion	NE	45	200	0	0	75,000	0	Struck 6 miles northwest of Nashville; moved through rural areas. Heaviest losses in Washington County.
2. Apr. 9	4:15 p.m.	Logan	NE	6	30	0	3	30,000	0	Rural area near Lincoln.
*3. Apr. 9	5:15 p.m.	Champaign and Vermillion	ENE	38	150	1	10	2,150,000	100,000	Began near Leverett; several small communities hit; moved into Indiana.
4. May 7	12:40p.m.	Crawford	(1)	(1)	(1)	0	0	0	0	2 tornado funnels formed over Palestine, but did not reach the surface.
5. May 7	12:40p.m.	Crawford	(1)	(1)	(1)	0	0	0	0	
6. July 5	Evening	McLean	(1)	(1)	(1)	0	0	0	0	Tornado funnel observed near Downs; did not reach the ground.
INDIANA										
1. Mar. 11	10 p.m.	Vigo	NE	200	100	0	0	500	0	1/2 mile east of New Goshen, small garage demolished; nearby trees showed twisting effect.
2. Mar. 14	P.m.	Parke	(1)	(1)	(1)	0	0	1,400	0	Possible tornado moved house from foundation, and blew off part of roof and shutters which were carried some distance. Occurred at Bridgeton.
3. Mar. 14	6:35 p.m.	Allen	ENE	3 1/2	33	0	0	12,000	0	Tornado struck south edge of Ft. Wayne, then skipped about 3 1/2 miles to demolish house and unroof another. Damage to power lines, television antennas, etc.
4. Mar. 18	7 p.m.	Adams	SE	4	25	0	0	6,600	0	Destroyed outbuildings on 1 farm and severely damaged others on adjacent farm, killing 6 cows. 3 1/2 miles southeast of Decatur.
*5. Apr. 9	7-9:15 p.m.	Fountain, Tippecanoe, Clinton, Tipton, Madison, and Delaware	E	106	200 to 1,300	2	12	1,000,000	0	Path in Indiana practically in same line as tornadoes earlier same date in Illinois. 150 buildings demolished or severely damaged; 1 auto carried 400 feet and demolished. Rate of movement in Indiana about 47 m.p.h. Hail variously described as size of walnuts or small lemons accompanied tornado. Path traceable from just south of Attica to 10 miles northeast of Muncie.

See reference notes at end of table.

# TORNADO DATA

Table 11-Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
INDIANA (Cont'd.)										
6, June 13	(1)	Tippecanoe	(1)	(1)	(1)	0	0	500	0	In Lafayette and vicinity unconfirmed tornado with reportedly visible funnel, cloud dipped into wooded area and downed a few trees.
IOWA										
1. Mar. 21	12:45 p.m.	Monona and Woodbury	(1)	(1)	(1)	0	2	(4)	0	Near Danbury roof of machine shed collapsed upon occupants. Barn and machine shed completely destroyed and other buildings damaged.
2. Mar. 21	1 p.m.	Crawford	(1)	(1)	600	0	0	6,500	0	Elevator destroyed, other buildings unroofed, windows broken; east of Ute.
3. Mar. 21	3 p.m.	Emmet	(1)	7	400	0	0	150,000	0	Farm buildings destroyed and damaged; some livestock killed in Jack Creek Township.
4. Mar. 21	5 p.m.	Tama	NNE	10	100	0	0	(4)	0	Buildings destroyed and damaged on farms and in town of Tama. Storm moved from 6 miles south-southwest of Tama to east of Toledo.
5. Apr. 24	5-5:30 p.m.	Iowa	ENE	(1)	(1)	0	0	(4)	0	Demolished farm buildings and killed livestock at West Pilot and Williamsburg.
6. May 10	3:15 p.m.	Wayne	(1)	(1)	(1)	0	0	20,000	0	Farmstead demolished northwest of Millerton.
* 7. May 10	4:10-4:30 p.m.	Cerro Gordo and Worth	NNE	28	200	0	3	1,000,000	0	Moved from about 5 miles southwest of Ventura to 8 miles west of Northwood. Many homes and buildings destroyed; heavy loss of livestock.
8. May 10	4:30 p.m.	Tama	(1)	(1)	(1)	0	0	20,000	0	Farmstead demolished southwest of Chelsea.
* 9. May 10	5:30 p.m.	Howard	NNE	6	400	0	2	(4)	0	Farmsteads severely damaged. Storm moved from 3 miles southwest of Chester and crossed into Minnesota.
10. May 10	6 p.m.	Clayton	NE	6	400	0	0	150,000	0	Heavy loss of farm buildings and livestock. Storm moved from near Elkader to Girard.
11. May 20	9 to 10:30 p.m.	Story, Hardin, Butler, Floyd, Chickasaw, and Howard	NE	120	400	1	0	(4)	0	Farmsteads damaged, 1 death from heart attack. Tornado first struck northwest of Gilbert, then Hubbard, Ackley, Vilmar, Bassett, and Alta Vista, then to Lime Springs.
12. May 20	10:10-11:10 p.m.	Linn and Jones	E	72	400	0	7	300,000	0	Buildings damaged in Cedar Rapids and nearby farmsteads. Severe damage to farmsteads in Martelle, Morley, and Wyoming.
13. May 24	6 a.m.	Iowa	(1)	(1)	(1)	0	0	(4)	0	Buildings damaged in Millersburg and vicinity.
14. June 7	6:15 p.m.	Plymouth	NE	10-70	200	0	0	1,350,000	0	Family of 5 tornadoes. Moved from Westfield to corner of Johnson Township. Damage listed for all 5.
15. June 7	7:30-8:30 p.m.	Ida, Sac, Buena Vista, Pocahontas, and Kossuth	NE							First reported north of Ida Grove, continued to Havelock, Plover, Whittemore, and Fenton.
16. June 7	8:30 p.m.	Calhoun, Pocahontas, and Humboldt	NE							First reported near Pomeroy, caused severe damage in Palmer, continued to Livermore where it left the ground.
17. June 7	9-9:20 p.m.	Webster and Wright	NE							First reported in vicinity of Gowrie, moved to Duncombe where damage was severe, then to Holmes and Belmond.
18. June 7	9:30 p.m.	Boone and Hamilton	NE							First reported near Pilot Mound, moved to near Jewell, with extensive damage in vicinity of Stanhope.
19. June 7	10:15-11:59 p.m.	Adair, Madison, Polk, Jasper, Poweshiek, Iowa, and Linn	ENE	100	200	0	0	200,000	0	Damage to farm buildings. Tornado first observed near Carson. Well-defined track began in extreme northeastern corner of Madison County, then to south of Newton and Grinnell, across extreme northwestern Iowa County with final damage north of Ely in southeastern Linn County.
20. June 27	3:45 p.m.	Adair	ENE	(1)	(1)	1	2	100,000	0	Occurred 4 miles southwest of Adair where 1 death and 2 injuries occurred, 4 farms demolished with heavy loss of livestock.
21. June 27	4:45 p.m.	Montgomery	(1)	(1)	(1)	0	0	10,000	0	Occurred 2 miles north of Stanton. 1 barn demolished and buildings on 7 other farms damaged.
22. June 27	5:15 p.m.	Warren	(1)	(1)	(1)	0	2	5,000	0	Occurred about 2 miles northwest of Indianola. 1 barn demolished and buildings on another farm damaged.
23. June 27	8 p.m.	Mahaska	(1)	(1)	(1)	0	1	3,000	0	Occurred north of Evans. Barn demolished.

See reference notes at end of table.



## TORNADO DATA

Table 11--Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
KANSAS										
1. Mar. 30	2:30 p.m.	Harper and Sumner	N	15	(3)	0	0	0	0	Moved 15 miles along Harper-Sumner County line to near Argonia.
2. Apr. 24	10 a.m.	Kingman	NNE	(1)	(1)	0	0	0	0	3 funnel clouds sighted aloft northwest of Kingman.
3. Apr. 24	10 a.m.	Kingman	NNE	(1)	(1)	0	0	0	0	
4. Apr. 24	10 a.m.	Kingman	NNE	(1)	(1)	0	0	0	0	
5. Apr. 24	10:40 a.m.	McPherson	NNE	(1)	(1)	0	0	0	0	Sighted aloft north of McPherson.
6. Apr. 24	11 a.m.	Ottawa	NNE	(1)	(1)	0	0	0	0	Sighted aloft near Bennington.
7. Apr. 24	12:03 p.m.	Saline	NNE	(1)	(1)	0	0	0	0	Sighted aloft over Salina Airport.
8. Apr. 28	1 p.m.	Kiowa	(1)	(1)	(1)	0	0	0	0	Sighted aloft 3 miles west and 3 miles south of Greensburg.
9. Apr. 29	2 p.m.	Lane	NE	2 1/2	(1)	0	0	0	0	Aloft 7 to 8 miles south of Dighton.
10. Apr. 29	4 p.m.	Lane	NE	500-600	70	0	0	0	0	Dipped to ground in open country, 1 to 2 miles northwest of Dighton.
11. May 9	9:10 p.m.	Republic	NNE	13	(1)	0	1	45,000	0	Damaged at least 10 farms from 1 mile south of Courtland to 12 miles north-northeast.
*12. May 10	2 to 3:30 a.m.	Sumner and Cowley	NE	(1)	(1)	0	0	30,000	0	From south of Caldwell in Oklahoma across Sumner and into Cowley County near Udall. 3 funnels seen near Udall, 2 touching ground. Damage listed for all 3 (# 12, 13, and 14). Several farmsteads damaged.
13. May 10	2 to 3:30 a.m.	Sumner	NE	(1)	(1)					
14. May 10	2 to 3:30 a.m.	Sumner	NE	(1)	(1)					
15. May 10	4 a.m.	Chase, Morris, Lyon, and Wabaunsee	NE	45	(3)	0	0	10,000	0	Loud roar over Cottonwood Falls where roof damaged and farmstead 6 miles northeast hit; cabins at Lake Kahola, 3 farms in northeast Lyon County, and area northwest of Harveyville suffered damage.
16. May 10	4:30 a.m.	Cowley and Elk	NE	1	440	0	0	(4)	0	Damaged buildings on 2 farms and leveled fences near Cambridge.
17. May 10	5:30 a.m.	Allen	NE	1/2	200	0	0	500	0	At Petrolia, loud roar with damage to small buildings, trees, and roofs.
18. May 16	3:15 p.m.	Morris	NE	2 1/2	220	0	0	1,200	0	Sighted first 2 1/2 miles southwest of Burdick; dipped 1 mile south.
19. May 16	3:15 p.m.	Morris	(1)	(1)	(1)	0	0	0	0	Seen aloft east of Burdick.
20. May 27	5 p.m.	Rawlins and Decatur	(1)	(1)	(1)	0	0	14,500	0	Along Rawlins-Decatur County line; destroyed barn, mills, 2 towers, small buildings, fences; uprooted 20 trees.
21. May 27	Early evening	Decatur	(1)	(1)	(1)	0	0	(5)	0	Slight damage to 1 farm, 3 miles southwest of Dresden.
22. May 27	Early evening	Stevens	(1)	(1)	(1)	0	0	(4)	0	Barn and small buildings destroyed on 2 farms southeast of Hugoton.
23. May 28	8:40 p.m.	Seward	NE	2 1/2	50	0	0	39,600	0	30-unit motel and cafeteria damaged in southern part of Liberal.
24. May 29	Late afternoon	Ford	(1)	(1)	(1)	0	0	(4)	0	Several small buildings destroyed in town of Bloom.
25. June 2	12:15 a.m.	Norton	ENE	(1)	(1)	0	0	0	0	Seen aloft 14 miles west of Norton.
26. June 5	7:15 p.m.	Montgomery	(1)	(1)	(1)	0	0	0	0	2 funnels sighted from Coffeyville.
27. June 5	7:15 p.m.	Montgomery	(1)	(1)	(1)	0	0	0	0	
28. June 5	7:30 p.m.	Elk	(1)	(1)	(1)	0	0	0	0	2 funnels seen aloft near Howard.
29. June 5	7:30 p.m.	Elk	(1)	(1)	(1)	0	0	0	0	
30. June 5	Early evening	Cherokee	(1)	(1)	(1)	0	0	(4)	0	Home damaged 1 mile south of Baxter Springs.
31. June 7	1 p.m.	Graham	NE	(1)	(1)	0	0	11,500	0	From 1 1/2 miles east of Morland to 10 miles north of Hill City, 6 farmsteads damaged. 3 funnels seen from near Hill City. Damage listed for all 3.
32. June 7	1 p.m.	Graham	NE	(1)	(1)					
33. June 7	1 p.m.	Graham	NE	(1)	(1)					
34. June 7	10:45 p.m.	Marion and Dickinson	NE	(1)	(1)	0	0	6,000	2,000	Destroyed or damaged buildings on 3 or 4 farms. Near Tampa; dipped again southwest of Herington.
35. June 19	1:35 p.m.	Marion and Morris	(1)	(1)	(1)	0	0	7,000	0	Collapsed sidewall of elevator under construction at Ramona; buildings on several farms and planes at Beechcraft plant in west Morris County damaged.
36. June 19	3 p.m.	Jackson	(1)	(1)	(1)	0	0	(4)	0	Dipped to 4 farms in north part of County west of Whiting.
37. June 19	4:45 p.m.	Mitchell	N; NNE	6	440	0	0	18,000	0	From 7 miles south of Cawker City, traveled north for 3 miles then north-northeast for 3 or 4 miles. Damage to 8 farms.
38. June 19	6:55 p.m.	Cloud	NE	(1)	(1)	0	0	0	0	Funnel cloud, described as quite large, seen aloft 4 miles north of Concordia.
39. June 21	6 p.m.	Sedgwick	(1)	(1)	(1)	0	0	0	0	Dipped in open field northeast of Wichita.
40. June 21	6 p.m.	Sedgwick	(1)	(1)	(1)	0	0	0	0	Observed aloft west of Wichita. Both this and preceding one observed at time of severe wind and hailstorm in Wichita.

See reference notes at end of table.

## TORNADO DATA

Table 11-Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
KANSAS (Cont'd)										
41. June 22	7 p.m.	Waubunsee	(1)	(1)	(1)	0	0	0	0	Observed by several persons, 10 miles southwest of Wamego.
42. June 24	4 p.m.	Meade	(1)	(1)	(1)	0	0	(4)	0	Damaged buildings on 3 farms about 7 miles southeast of Plains.
43. June 24	7:30 p.m.	Kingman				0	0	10,000	0	Damaged house and other buildings on farm and blew down drive-in screen 1 1/2 miles southeast of Kingman.
44. June 24	8:45 p.m.	Sherman	(1)	(1)	(1)	0	0	0	0	Funnel cloud observed aloft 18 miles north of Goodland.
45. July 4	4 p.m.	Cloud	NE	1	75	0	0	5,000	0	Damage to 2 or 3 farms in eastern Cloud County.
46. July 15	2:08 p.m.	Sedgwick	NNW	(1)	(1)	0	0	0	0	Dipped briefly in open field 2 miles west of Valley Center.
47. July 16	7:27 p.m.	Barber	(1)	(1)	(1)	0	0	0	0	3 funnel clouds sighted from Sharon, 2 about 8 miles south and a larger one (also seen from Medicine Lodge) about 10 miles west and was distinguishable for 3 minutes.
48. July 16	7:27 p.m.	Barber	(1)	(1)	(1)	0	0	0	0	
49. July 16	7:27 p.m.	Barber	(1)	(1)	(1)	0	0	0	0	
50. July 23	4 p.m.	Morton				0	0	0	0	Seen aloft in north part of County.
51. Aug. 2	3 p.m.	Marshall	NE	3-4	(3)	0	0	5,000	0	Light damage 2 miles northwest of Waterville.
52. Aug. 2	4:30 p.m.	Sumner	N	1/2 250	250	0	0	11,000	100	Small dark cloud. Dust reduced visibility to zero. Debris carried 1/4 mile northward. Occurred near Milan.
KENTUCKY										
(None reported)										
LOUISIANA										
1. Feb. 6	1-1:15 p.m.	Livingston and Tangipahoa	ENE	15	400	2	21	729,000	200,000	Began in Centerville community, Livingston Parish, moved through Albany and North Hammond into wooded uninhabited area. 26 homes destroyed, 107 heavily damaged; 35 buildings including several warehouses destroyed and 51 damaged. Crop damage primarily to strawberries, mostly from heavy rains and flying debris.
*2. Mar. 22	Afternoon	Vernon, Natchitoches, Grant, Winn, Caldwell, Richland, and West Carroll and East Carroll	NE	180	200	2	22	750,000	10,000	Developed around Camp Polk and Leesville in Vernon Parish, moved into northern Issaquena and into Washington Counties, Miss., where it degenerated in area of heavy squalls. Most of damage occurred at Columbia, Caldwell Parish, with damage over wide area in Winn Parish; was line squall several miles wide over most of path.
3. Apr. 29	9:37 a.m.	Calcasieu	NE	(1)	(1)	0	0	2,000	0	Funnel cloud down to 400 feet of ground, 250 yards southwest of Lake Charles WBAS; winds 75 m.p.h.; barometer fell from 29.36 inches to 29.12, back to 29.34 inches. High winds damaged several buildings.
4. Apr. 29	12:30p.m.	Lincoln	NE	10	200	0	0	2,500	1,000	8 miles east of Ruston, 6 homes and several other buildings damaged.
5. May 2	Afternoon	Assumption	NE	(1)	(1)	0	0	10,000	50,000	Some buildings and much sugarcane damaged near Napoleonville.
6. May 16	3:30 a.m.	Acadia and St. Landry	NE	20	150	0	3	150,000	(4)	Developed as thundersquall near Church Point, Acadia Parish; formed a tornado and struck Lewisburg, near Opelousas, then to Port Barre where it dissipated. Several buildings destroyed, many damaged.
7. May 16	6-7 p.m.	Natchitoches and Winn	ENE	25	200	0	0	100,000	(4)	Developed near Black Lake, moved near Dodson to Sikes. Destroyed several buildings, damaged many more; destroyed large amounts of timber; damaged power and communication lines.
8. May 16	P.m.	Caddo	NE	2	50	0	0	20,000	(4)	Brief, but definite tornado; several homes and other buildings destroyed, several damaged in Greenwood and vicinity; damaged timber and power lines.
9. May 16	P.m.	Jackson	ESE	20	100	0	2	100,000	(4)	Developed in vicinity of Quitman; several large buildings destroyed, school badly damaged, and several homes damaged. Moved through Chatham, destroying several buildings and damaging several homes.

See reference notes at end of table.



# TORNADO DATA

Table 11-Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
LOUISIANA(Cont'd)										
10. May 17	1-2 a.m.	Richland, West Carroll, and East Carroll	NE	38	100	0	17	150,000	(4)	Developed about 4 miles east of Rayville, Richland Parish; moved through southeastern portion of West Carroll Parish, then through East Carroll Parish to within about 3 miles south of Lake Providence, where it was lost in Mississippi swamp lands.
11. May 18	Noon	Allen	NE	(1)	(1)	0	1	5,000	(4)	Small and brief tornado destroyed 1 home, damaged several others in Cherie Wenche community.
12. May 18	1:30 p.m.	St. Helena	NE	(1)	(1)	0	0	5,000	(5)	Passed over mostly wooded areas.
13. July 17	11:20 a.m.	Orleans	NE	4	34	0	2	50,000	0	Occurred in northeastern portion of New Orleans; began as a waterspout about Industrial Canal area, and moved up Intercoastal Waterway, developing into tornado when it reached land, then moved through Gentilly and Plum Orchard communities; 1 church, home, warehouse and several other buildings destroyed, several homes and other buildings damaged. Left no path such as tornadoes generally do.
14. Oct. 25	3:30 a.m.	Calcasieu	NE	(1)	(1)	0	0	4,000	0	Several buildings destroyed and several others damaged southwest of Lake Charles.
15. Nov. 21	P.m.	St. Charles	NE	1	100	0	0	2,500	2,500	Near Luling, destroyed several barns.
16. Nov. 21	10-11 p.m.	Lafayette and St. Martin	NE	18	300	0	2	200,000	50,000	Through Youngsville, Broussard, and Cypress Island; destroyed 30 homes, many barns, and several other buildings; livestock killed. About 200 persons left homeless.
17. Dec. 3	1-4:30 a.m.	Vernon, Rapides, Grant, La Salle, and Franklin	NE	75	300	9	50	500,000	10,000	Originating near Cravens, Vernon Parish, moved through Leander, Lecamp, and Hineston areas, then north of Alexandria, through Paradise, east of Colfax, through Dry Prong to Tullos and into Franklin Parish, where it dissipated. 40 homes and buildings destroyed, about 100 damaged; much timber destroyed; and stored crops damaged. High winds accompanied it on both sides over an area 20 miles wide. Rain excessive over all of area.
18. Dec. 3	3 a.m.	DeSoto	NE	1	100	0	3	5,000	0	1 home destroyed, near Mansfield.
19. Dec. 5	P.m.	Union	NE	8	(1)	0	16	20,000	500	Developed a few miles southwest of Spearsville and moved through edge of town; destroyed 1 home and 3 other buildings and damaged several others.
*20. Dec. 5	5-6 p.m.	Ouachita, Union, and Morehouse	NE	25	(1)	0	11	25,000	1,000	Developed near Spencer and moved through Beekman, with funnel alternately lifting and lowering; then moved into Arkansas where it damaged much timber, and then into Mississippi where it struck a farming community about 10 miles west of Clarksdale.
MARYLAND										
1. May 26	3-4 p.m.	Prince Georges	SE	1	200	0	0	3,500	(4)	Occurred at Clinton.
2. July 2	9 p.m.	Anne Arundel	(1)	(1)	(1)	0	0	(4)	(4)	Tree limbs and trees broken; signs smashed; utilities interrupted in Annapolis and vicinity.
MAINE										
1. June 6	3:15-3:45 p.m.	Penobscot	NE	1/8	33	0	0	500	0	Tornado struck at farm property located about 2 miles north of Dexter; storm demolished a 20x30-foot storehouse. Eye-witnesses report that storehouse was lifted 3 times into air before it was smashed to ruins.
2. July 7	12:45 p.m.	Cumberland	(1)	(1)	7	0	1	(4)	0	Small twister dipped down at Freeport, in country area where men were working on road. It swept up again over wooded area, carrying off some loose debris and inflicting minor cuts and bruises on 1 workman.
MASSACHUSETTS										
1. May 4	3:55 p.m.	Essex	E	2 1/2	2	0	0	500	0	"Fair weather" waterspout apparently formed about 2 miles west of Salem on South River; followed course of

See reference notes at end of table.

## TORNADO DATA

Table 11-Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
MASSACHUSETTS (Cont'd)										
2. June 9	3:25-4:45 p.m.	Worcester	SE	46	200-1600	90	1,288	52,143,000	50,000	that river to Naval Reserve dock at mouth of South River in Salem Harbor, then dissipated as it moved in direction of Marblehead. Storm lifted 30-foot lobster boat 6 inches into air, ripped off its windshield and damaged steering gear and instrument panel.
3. June 9	4:30-5:37 p.m.	Worcester, Norfolk, and Bristol	SE	29	200-1200	0	17	671,000	10,000	This tornado, (one of a series which also struck just south of this area and Exeter, N.H.) was the most violent and destructive tornado in New England's history; and its length, width and extent of devastation rank it among the major tornadoes of record in the United States. Its average rate of forward speed was 36 m.p.h. Towns in its path included Petersham, Barre, Rutland, Holden, Worcester, Shrewsbury, Westboro, Southboro, and Fayville.
MICHIGAN										
1. May 17	4 p.m.	St. Joseph	NE	6	(3)	0	0	3,000	0	This small tornado damaged a few trees at Mottville, then moved north-eastward up the river picking up various small buildings. Power plant at Constantine had door and several windows and part of roof ripped off.
2. May 21	4:21-7 p.m.	St. Clair	ENE	90	350-2600	2	68	2,500,000	0	Tornado struck first at Smiths Creek then moved east-northeast 8 miles. After turning east it struck the south edge of Port Huron, crossed into Sarnia, Ontario. The tornado apparently had 2 or 3 funnels projecting downwards which later apparently merged in Port Huron. 90 homes were destroyed, 300 damaged, and 83 other buildings destroyed and 124 damaged.
3. May 30	7-8 p.m.	Delta	(1)	(1)	(1)	0	0	0	0	Waterspout formed off Peninsula, near Garden.
4. June 3	4:05-4:10 p.m.	Wayne	ENE	1	50	0	0	300	100	Tornado began 2 miles east of Plymouth, then lifted and passed through tops of trees for a mile. A couple of branches imbedded in a roof. Power lines blown down.
5. June 5	6 p.m.	Saginaw	NE	5	(1)	0	0	40,000	C	Tornado traveled northeasterly from point 1 mile northeast of Bridgeport. Several barns were destroyed.
6. June 8	6:25-6:32 p.m.	Monroe	NE	6	100-300	4	18	460,000	40,000	Tornado first observed over Temperance and traveled 3 miles. As it passed over U.S.#24, some cars and trucks were tossed off road. After lifting over the town of Erie, a 1 1/2 mile path of destruction occurred along Substation Road. In Monroe County, 15 homes were destroyed, 14 damaged; 65 farm buildings were destroyed and 15 damaged. The tornado was observed over Lake Erie by pilots for another 44 minutes as a waterspout with considerable debris in the air.

See reference notes at end of table.



# TORNADO DATA

Table 11--Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
MICHIGAN (Cont'd)										
7. June 8	7:30-8:10 p.m.	Washtenaw	ENE	8	70	1	5	39,500	500	Tornado traveled through open country, at 15-20 m.p.h., from a point 5 miles northeast of Manchester to 5 miles southwest of Ann Arbor where it lifted and was last seen just north of Ypsilanti. 1/4 inch hail was reported. 1 home, 3 barns, and several smaller buildings were demolished.
8. June 8	7:30 p.m.	Livingston	NE	10	100-300	0	11	502,000	500	This tornado was reported aloft over Brighton at 7:15 p.m., but did not reach the ground until it passed over General Motors Proving Ground, 6 miles further northeast. It traveled over ground 35-40 m.p.h. 4 homes and a barn were demolished; 5 stores and a post office were damaged and 24 cars crushed.
9. June 8	8:08-8:12 p.m.	Alcona	E	3	100	0	0	75,000	0	Tornado began 1 mile south of Spruce. Destroyed 5 barns and livestock.
10. June 8	8:20-8:40 p.m.	Iosco	NE	18	140-880	4	13	500,000	C	Tornado traveled from Indian Lake to Lake Huron. 1/4 inch hail was reported. 5 homes were destroyed and 6 damaged; 6 other buildings were demolished.
11. June 8	8:30-10:40 p.m.	Genesee, Lapeer, and St. Clair	E	70	50-1760	116	867	19,000,000	C	The tornado began 2 miles north of Flushing and was 1/2 mile wide when it struck the northern edge of Flint, moving eastward down Coldwater Road with complete destruction. The funnel cloud then followed the Flint River to Columbiaville. Its path is not definite east of Columbiaville. Either a new funnel formed or displacement to the south took place after lifting. The path of destruction resumed at Kings Mill and on an easterly course moved on to Lake Huron, passing north of Yale and between Jeddo and Lakeport. In the 3 counties affected, 386 homes were destroyed and 525 were damaged. Farm buildings destroyed totaled 364 while 37 were damaged. In St. Clair County, authorities estimated the loss of farm machinery at \$130,000 and to livestock, \$11,000.
12. June 8	10 p.m.	Huron	(1)	(1)	(1)	0	0	0	0	Tornado sighted aloft at Sand Point
13. June 25	4:15 p.m.	Macomb	NE	(1)	(1)	0	0	0	0	Tornado sighted aloft at Mound Road and Eighteen Mile. Considerable damage occurred at this same time in Detroit area from strong winds and lightning.
14. June 30	(1)	Ontonagon	(1)	10	580	0	0	150,000	0	A tornado is believed to have occurred at this time, although not observed, which levelled about 1,920 acres of timber in a remote region northeast of Ironwood and west of White Pine Mine.
15. July 5	Evening	Alcona	(1)	(1)	(1)	0	0	500	0	A small "twister" jarred 5 houses and uprooted several trees at Glennie.
16. July 6	1-1:15 p.m.	Alger	(1)	(1)	(1)	0	0	2,000	0	Tornado was seen on Lake Superior west of Powell's Point heading toward Munising. 3 cars overturned.
17. Sept. 20	P.m.	Emmet	NE	(1)		0	0	0	0	Short-lived tornado cloud seen northwest of Petosky.
MINNESOTA										
1. Mar. 21	4:43 p.m.	Stearns	NE	11	100	1	0	50,000	0	Funnel dipped to earth in North St. Cloud where launderette, storage warehouse, lumber yard, and several garages demolished and several store fronts blown out. Boy killed when launderette wrecked.
2. May 10	3:55 p.m.	Pope and Douglas	N	20	440	0	0	100,000	C	About 35 farms damaged. Many trees uprooted. Poles, wires down. On some farms, nearly all buildings destroyed. 5 funnels reported sighted near Starbuck. Path not continuous. First great destruction occurred 4 1/2

See reference notes at end of table.

# TORNADO DATA

Table 11-Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
MINNESOTA(Cont'd)										
3. May 10	3:55 p.m.	Pope and Douglas	N							miles south of Lake Emily; last great destruction west of Lowry.
4. May 10	3:55 p.m.	Pope and Douglas	N							
5. May 10	3:55 p.m.	Pope and Douglas	N							
6. May 10	3:55 p.m.	Pope and Douglas	N							
*7. May 10	5 p.m.	Freeborn	ENE	8	60	6	3	35,000	C	Clapboard home on farm 1 mile south of Hollandale demolished and 6 occupants killed and 2 injured; 1 other home destroyed and 10 small buildings damaged on same farm; 1 person injured and considerable property damage in locality between Hollandale and Maple Island. Funnel reported sighted 1 mile south of Hollandale. Path not continuous.
*8. May 10	5:45-6:30 p.m.	Fillmore, Olmsted, and Winona	NNE	48	34	2	17	500,000	C	Many buildings demolished or damaged. Hundreds of trees uprooted. Some livestock killed and much poultry perished. Many poles and wires down. Farmer killed near Wykoff. Funnel sighted 1 1/2 miles west of St. Charles where 2 automobiles blown off road and a passenger killed. Path not continuous. Tornado entered State from Iowa, crossed into Wisconsin.
9. June 7	7 p.m.	Martin	NE	20	(3)	0	0	40,000	C	In vicinity of Triumph. Several barns and other outbuildings, silos, windmills, and a steel grain bin demolished. Some livestock and much poultry perished. Many trees uprooted. Poles and wires down.
10. June 20	4:15 p.m.	St. Louis	(1)	(1)	(3)	0	0	(4)	C	In Lake Kabetogama vicinity. A boat was lifted and the outboard motor smashed; many trees uprooted; 1 cabin damaged slightly; major damage to timber occurred. A funnel reported observed.
11. July 21	3:30 p.m.	Dakota	(1)	(1)	(3)	0	0	0	0	Funnel sighted by observers at Holman Airport control tower in St. Paul and appeared to be 15 to 20 miles to the south of Holman Airport. The cloud dipped close to earth.
12. July 25	6:15 p.m.	Blue Earth	NE	1/2	67	0	1	100,000	C	In Eagle Lake vicinity. Lumber yard and house wrecked and number of residences and business places damaged. Top of grain elevator lifted and the building twisted. Boxcar tilted over. Poles, wires down. A number of trees uprooted. 3 funnels which merged into 1 huge cloud observed just before storm struck.
13. Aug. 18	6 p.m.	Stearns	E	(1)	(3)	0	0	(3)	(5)	4 thin separate funnels observed to develop just west of St. Martin, but only 1 funnel descended to earth destroying several acres of corn and lifting several yearling heifers into air. An airplane pilot sighted another very small funnel development near Elrosa.
14. Aug. 18	6 p.m.	Stearns	E							
15. Aug. 18	6 p.m.	Stearns	E							
16. Aug. 18	6 p.m.	Stearns	E							
17. Aug. 18	6 p.m.	Stearns	E							
MISSISSIPPI										
1. Jan. 22	11-11:45 p.m.	Issaquena, Sharkey and Humphries	NNE	45	100	0	1	110,000	(5)	Developed in southeastern Issaquena County and moved north-northeastward through Sharkey into Humphries County. The communities of Louise, Midnight, and Silver City hardest hit, all in Humphries County. 12 homes and 51 other buildings destroyed; 38 homes and 46 other buildings damaged.
2. Feb. 20	11 a.m.	Washington	NE	1	100	0	2	25,000	(5)	In Glen Allen and Hampton communities; destroyed 1 home; several homes and other buildings damaged.
3. Feb. 20	Noon	Carroll and Grenada	NE	15	100	0	0	20,000	(5)	Passed through mostly thinly settled areas. Carrollton, Carroll County, to near Elliot, Grenada County.
4. Feb. 20	Noon	Pontotoc	NE	20	100	0	0	2,500	(5)	Damaged an unoccupied house; passed through thinly settled area.

See reference notes at end of table.



# TORNADO DATA

Table 11-Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
MISSISSIPPI (Cont'd)										
5. Feb. 29	Afternoon	Chickasaw, Pontotoc, and Lee	NE	20	100	0	0	2,500	(5)	Northern Chickasaw County through extreme southeastern tip of Pontotoc into Lee County; thinly settled area.
6. Mar. 14	2:30 p.m.	Prentiss	NE	3	40	1	0	10,000	1,000	Occurred at Hills Chapel settlement, 8 miles east of Booneville; 2 homes destroyed, 6 damaged.
7. Mar. 22	Afternoon	Simpson, Smith, Jasper, Newton, and Lauderdale	NE	90	(1)	0	1	915,000	8,000	Many homes and other buildings destroyed and damaged.
*8. Mar. 22	Afternoon	Issaquena and Washington	NE	40	200	0	0	5,000	(5)	Originated around Camp Polk and Leesville in Vernon Parish, La. moved northeastward to northwestern portion of Issaquena and into Washington County where it degenerated into an area of heavy squalls.
9. Mar. 31	2 p.m.	Coahoma	NE	8	(1)	0	0	50,000	5,000	Funnel cloud seen at Farrell and Stovall; 2 barns destroyed, 2 homes and several other buildings damaged.
10. Apr. 4	3:03 p.m.	Stone	NE	(1)	100	0	0	15,000	5,000	Hit north section of Wiggins, and lasted about 3 minutes; wind speed estimated up to 120 m.p.h.; several homes and other buildings damaged; trees up to 24 inches in diameter were uprooted and twisted off.
11. Apr. 14	2:30 p.m.	Clay	NE	(1)	(1)	0	0	7,000	1,000	Several buildings damaged; about 10 miles northwest of West Point.
12. Apr. 24	2 p.m.	Jefferson, Copiah, Claiborne, Hinds, and Rankin	NE	90	10-50	0	0	40,000	5,000	Light hail reported; many outbuildings destroyed and damaged; at Jackson in Hinds County 4 homes and several other buildings damaged; several homes and buildings damaged at Fayette in Jefferson County.
13. May 4	10:30 a.m.	Smith	NE	1 1/2	200	0	1	20,000	1,000	In Taylorsville. Destroyed 2 homes, 3 other buildings and damaged several others; cleared a path 200 yards wide for 1 1/2 miles; funnel and debris seen over a mile away.
14. May 4	11:15 a.m.	Alcorn	NE	8	(1)	0	0	50,000	2,000	Destroyed 1 building and damaged several others at Corinth.
15. May 4	Morning	Stone	NE	6	100	0	0	15,000	2,000	Occurred in Wiggins. Winds estimated up to 120 m.p.h., lasted for 3 minutes; damaged several homes and buildings and uprooted trees, some up to 24 inches in diameter.
16. May 4	Afternoon	Noxubee	NE	9	100	0	2	25,000	2,000	4 miles east of Macon; 5 homes, 6 buildings destroyed; 10 homes and 7 buildings damaged.
17. May 14	2:30 p.m.	Clay and Monroe	NE	18	100	0	1	20,000	1,000	Several homes and buildings destroyed and damaged at West Point in Clay County. Others damaged in Monroe County.
18. Aug. 8	9 p.m.	Hinds	NE	(1)	(1)	0	0	5,000	0	Unroofed a grandstand and warehouse, damaged several other buildings, in northeastern Jackson.
19. Aug. 9	1:15 p.m.	Harrison	(1)	(1)	(1)	0	0	3,500	0	Waterspout reached land and damaged 2 houses and shrubbery at Pass Christian.
20. Dec. 3	5:30 a.m.	Issaquena and Sharkey	NE	15	300	0	20	410,000	100,500	Most damage at Fidler community in Issaquena County; 40 persons homeless; 45 buildings destroyed; some damage in west-central Sharkey County; most damage to crops was to harvested crops and agricultural supplies in storage.
21. Dec. 5	5:35 p.m.	Warren	NE	7	500	38	270	25,000,000	0	Tornado apparently developed on the Louisiana-Mississippi border just south of Vicksburg and did not touch the ground until near the edge of town. Traveling toward northeast at a speed of 40-50 m.p.h., it cut a path of total destruction about a block wide across 7 blocks of the main business district, where it lifted, only to come to earth in a residential district to repeat its destruction. Several children killed and many injured when the roof of a theater collapsed as the tornado funnel lifted. Destruction included 275 homes, 17 industrial plants, 76 business buildings destroyed; 300 homes, 12 plants, and 200 business buildings damaged. Temperature fell to around freezing, with all gas and electric power off. It was described as the "worst disaster the city has suffered since the Civil War."

See reference notes at end of table.

# TORNADO DATA

Table 11--Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
MISSISSIPPI (Cont'd)										
*22. Dec. 5	8:15 p.m.	Coahoma	NE	8	(1)	0	11	24,000	1,000	Developed near Spencer, La., and moved northeastward across southeastern corner of Arkansas and struck a farming community about 10 miles west of Clarksdale; 11 homes and 5 other buildings destroyed; 3 homes and 5 other buildings damaged.
MISSOURI										
1. Mar. 14	5 p.m.	Lincoln	(1)	(6)	(3)	0	1	3,000	0	In Elsberry building under construction collapsed, injuring worker; auto and roofs damaged.
2. Mar. 31	4-4:30 p.m.	Bates and Henry	E	(1)	(1)	0	0	9,500	0	2 barns destroyed in Adrian and Ulrich; cow and hens killed.
3. Mar. 31	5 p.m.	Henry	(1)	(1)	(1)	0	0	0	0	Funnel cloud near Norris.
4. May 10	2 p.m.	Texas	(1)	(1)	(1)	0	0	6,000	0	Large barn demolished near Kinderpost.
5. May 26	7 p.m.	Pemiscot	(1)	(1)	(1)	0	0	0	0	Funnel cloud near Cooter, Steele, and Cottonwood Point.
6. Aug. 1	Afternoon	Franklin	NE	8	(1)	0	0	5,000	0	Near Oak Hill, barn destroyed, another unroofed; some timber and corn destroyed.
7. Aug. 3	5 p.m.	Bates	(1)	(1)	(1)	0	0	0	0	Only 2 farms affected near Pleasant Gap.
MONTANA										
1. May 24	4 p.m.	Wibaux	NE	7	400	0	0	10,000	0	3 separate tornado funnels about 4 miles west of Wibaux to 4 miles east; most severe in middle. Middle funnel struck east edge of town. Damaged several buildings and residences.
2. May 24	4 p.m.	Wibaux	NE							
3. May 24	4 p.m.	Wibaux	NE							
4. June 7	6 p.m.	Lewis and Clark	(1)	(1)	(1)	0	0	0	0	2 funnel clouds observed during thunderstorm; 1 touched ground briefly about 13 miles southeast of Augusta.
5. June 7	6 p.m.	Lewis and Clark	(1)	(1)	(1)	0	0	0	0	
6. June 23	8:55-9 p.m.	Dawson	NE	30	1320	0	1	50,000	0	Damage to town of Lindsay. No estimate of damage to farms outside of Lindsay.
7. June 23	9-10 p.m.	Dawson	E	(1)	10	0	0	(4)	0	Damage to barn and granary near Lindsay.
8. July 20	2-3 p.m.	Chouteau	E	(1)	(1)	0	0	0	0	2 funnel clouds observed during hailstorm in vicinity of Lonesome Lake.
9. July 20	2-3 p.m.	Chouteau	E	(1)	(1)	0	0	0	0	
10. July 30	7 p.m.	Roosevelt				0	0	(4)	0	Small tornado damaged buildings at Wolf Point Airport.
NEBRASKA										
1. Apr. 28	4:30 p.m.	Valley	(1)	(6)	30	0	0	1,200	0	Cowshed destroyed 8 miles north of Ord.
2. Apr. 28	7 p.m.	York	(1)	(6)	(3)	0	0	500	0	Chicken house destroyed and minor damage to adjacent structures at Bradshaw.
3. May 9	9 p.m.	Wayne	NE	1-2	(3)	0	0	5,000	(5)	Several buildings damaged 6 miles south of Randolph.
4. May 9	3:40-10:15 p.m.	Thayer to Seward	NNE	50	500	5	62	2,500,000	(4)	Much of Hebron destroyed, also many farm buildings and an airport. Storm moved from southwest of Hebron to Milford.
5. May 9	11 p.m.	Dawson	NE	1-2	(3)	0	0	2,000	(5)	Large barn and other buildings destroyed in eastern part of County.
6. May 10	1:10 a.m.	Seward	(1)	(1)	(1)	0	0	1,000	(5)	In northwestern portion of County.
7. May 10	6 a.m.	Richardson	NE	1-2	(3)	0	0	1,000	(5)	Several farm buildings destroyed in northwestern portion of County.
8. May 10	1:30 p.m.	Otoe	(1)	(6)	33	0	0	700	(5)	Occurred 3 1/2 miles south of Nebraska City.
9. May 10	3 p.m.	Nemaha	(1)	(1)	(1)	0	0	0	0	3 funnels observed southwest of Auburn; did not reach ground.
10. May 10	3 p.m.	Nemaha	(1)	(1)	(1)	0	0	0	0	
11. May 10	3 p.m.	Nemaha	(1)	(1)	(1)	0	0	0	0	
12. May 17	1:35 p.m.	Cherry	NE	5	(3)	0	0	0	0	Path through sparsely settled range country 16 miles southeast of Gordon.
13. May 26-27	Midnight	Buffalo	(1)	(6)	(3)	0	0	1,000	0	Wagon loaded with corn and small buildings between house and barn destroyed, but neither house nor barn damaged; in southeastern portion of County.
14. May 29	3:30 p.m.	Hall	(1)	(1)	(1)	0	0	(4)	0	Set of farm buildings destroyed in northeastern corner of County.
15. June 2	3 p.m.	Sheridan and Cherry	ENE	70-80	(3)	0	0	(5)	0	Path through sparsely settled range country 25 miles south of Gordon to near Crookston.
16. June 2	3:40 p.m.	Cherry	ENE	15	(3)	0	0	1,000	0	In sparsely settled range country 12 to 14 miles north of Whitman.
17. June 2	3:45 p.m.	Dawes	(1)	1-2	(3)	0	0	0	0	Funnel cloud observed in uninhabited country east of Chadron.

See reference notes at end of table.



# TORNADO DATA

Table 11—Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
NEBRASKA (Cont'd)										
18. June 5	6:15 p.m.	Dundy	NE	10	(3)	0	0	24,000	0	
19. June 7	Afternoon	Hamilton	NE	4	(3)	0	0	10,000	(5)	3 sets of farm buildings damaged 5 miles northwest of Giltner.
20. June 7	Afternoon	Hamilton	(1)	2-3	(3)	0	0	2,000	0	Occurred 6 miles southwest of Phillips.
21. June 7	Afternoon	Butler	NE	(6)	(3)	0	4	50,000	(5)	Occurred near Rising City.
22. June 7	2:30 p.m.	Custer	NE	9	100	0	0	50,700	200	Occurred 2 miles east of Mason City.
23. June 7	3 p.m.	Valley	NNE	5	550	11	0	156,300	(4)	Several sets of farm buildings and 2 cars destroyed 5 miles east of Arcadia.
24. June 7	4:15 p.m.	Boone	NE	9	220	0	0	80,000	10,000	Tornado occurred northwest of Albion.
25. June 7	4:20 p.m.	Greeley	(1)	(6)	(3)	0	0	15,000	(5)	Storm moved into uninhabited region 4 miles east of Scotia.
26. June 7	4:30 p.m.	Franklin	N	9	33	0	0	4,000	0	Tornado moved from Macon to Upland.
27. June 7	4:30 p.m.	Franklin	(1)	(6)	(3)	0	0	15,500	10,000	Tornado and hail 6 1/2 miles west of Campbell.
28. June 7	5 p.m.	Pierce	(1)	(6)	(3)	0	0	500	(5)	Set of farm buildings damaged near Foster.
29. June 7	5 p.m.	Madison	(1)	(1)	(3)	0	0	(4)	(5)	2 sets of farm buildings badly damaged near Battle Creek.
30. June 7	5 p.m.	Pierce and Cedar	NNE	15	(3)	0	1	31,000	10,000	2 small tornadoes observed near Pierce and Randolph.
31. June 7	5 p.m.	Pierce and Cedar	NNE							
32. June 7	5:40 p.m.	Dixon	NE	1 1/2	(3)	0	0	1,600	200	Occurred 3 miles northwest of Allen.
33. June 7	7 p.m.	Dodge	(1)	(1)	(3)	0	4	(4)	(5)	Set of farm buildings destroyed near Hooper.
34. June 7	Late afternoon	Butler	(1)	(1)	(1)	0	0	50,000	(5)	In Octavia; some spotted hail damage.
35. June 7	Late afternoon	Washington	(1)	(1)	(3)	0	0	10,000	(5)	Possible tornado occurred near Herman.
36. June 8	3 p.m.	Deuel	(1)	(1)	30-150	0	0	300	(5)	3 small tornadoes, only 1 caused damage near Big Springs.
37. June 8	3 p.m.	Deuel								
38. June 8	3 p.m.	Deuel								
39. June 19	Afternoon	Webster	(1)	(1)	(3)	0	0	2,000	(5)	2 sets of farm buildings damaged 9 miles southeast of Campbell.
40. June 19	8 p.m.	Wayne	(1)	(1)	(3)	0	0	2,500	0	Set of farm buildings destroyed and 4 cattle killed south of Wayne.
41. June 21	Afternoon	Cheyenne	(1)	1/2	(3)	0	0	0	0	Funnel cloud observed in uninhabited region near Sidney.
42. July 3	4 p.m.	Saunders	SE	4-6	(3)	0	0	2,500	0	Occurred in southeastern portion of County.
43. July 7	9:30-10 p.m.	Garden	(1)	(1)	(1)	0	0	(4)	0	Probable small tornado near Oshkosh.
44. July 20	2:50 p.m.	Scotts Bluff	NE	(1)	(3)	0	0	800	(5)	Storm moved into very sparsely settled area near Scotts Bluff.
45. July 21	4:30 p.m.	York	(1)	(6)	(3)	0	0	1,100	0	Small hangar and plane damaged near Waco.
46. July 26	Late afternoon	Dodge	(1)	(1)	(3)	0	0	500	(5)	Small tornado with some hail west of Scribner.
47. July 26	Afternoon	Hall	(1)	(6)	(3)	0	0	0	0	Funnel did not reach ground; near Cairo.
48. July 26	Evening	Colfax	(1)	(1)	(1)	0	0	0	0	Possible small tornado at Columbus.
49. July 28	Afternoon	Sioux	NNE	(1)	(3)	0	0	2,500	(4)	Storm moved into uninhabited country in northern part of County.
50. Aug. 2	3:30 p.m.	Gage	(1)	5	(3)	0	0	1,200	(5)	A few small buildings damaged near Wymore.
51. Aug. 6	7:30 p.m.	Furnas	(1)	(6)	(3)	0	0	0	0	Path in open fields, crops had been harvested; near Hendley.
NEVADA										
1. May 28	9:30 a.m.	Nye	NNE	15-20	(1)	0	0	0	0	Near Tonopah; 4 additional funnel clouds of short duration were observed seceding the largest one.
2. May 28	9:30 a.m.	Nye				0	0	0	0	
3. May 28	9:30 a.m.	Nye				0	0	0	0	
4. May 28	9:30 a.m.	Nye				0	0	0	0	
5. May 28	9:30 a.m.	Nye				0	0	0	0	
NEW HAMPSHIRE										
1. June 9	4:20 p.m.	Rockingham	NE	1 1/2	100	0	5	100,000	0	This tornado 2d in series which also struck over central and eastern Massachusetts on this date. Occurring in the Jady Hill section of Exeter, storm demolished Exeter Country Club, damaged a number of homes and business establishments, and crippled utility services.
2. June 9	(1)	Strafford	(1)	(1)	(1)	0	0	300	0	An orchard and woodland as well as a small farm building in Rollinsford struck by "baby" tornado. Area affected quite small.
NEW JERSEY										
(None reported)										

See reference notes at end of table.

Table 11--Continued

## TORNADO DATA

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
NEW MEXICO										
(None reported)										
NEW YORK										
(None reported)										
NORTH CAROLINA										
1. Mar. 15	9-10 p.m.	Nash, Wilson, and Edgecombe	E	30	25	0	1	100,000	0	First noted in Bailey, Nash County, moved across Wilson County and into Edgecombe County. Main damage in city of Wilson.
2. Apr. 16	Noon	Beaufort and Pitt	(1)	2	100	0	0	8,000	5,000	Struck near Grimesland, Pitt County, entered Beaufort County.
3. Apr. 30	7 p.m.	Jones, Pender, and Onslow	(1)	(1)	(1)	0	0	11,000	0	Farm buildings damaged, roofs blown off.
NORTH DAKOTA										
1. May 29	8 p.m.	Morton and Emmons	NE	20	600	2	20	80,000	0	First struck southwest of Fort Rice; moved into Fort Rice, destroying almost the entire town; crossed into Emmons County.
2. May 29	Evening	Richland	(1)	(1)	(1)	0	0	5,000	0	Struck farm 5 miles south of Wyndmere, leveling a 70-foot barn.
3. May 29	11 p.m.	Cass	N	3	100	0	0	8,000	0	Struck about 2 miles east of Gardener, destroying some and damaging other buildings on 3 farms.
4. May 30	Afternoon	Stutsman	(1)	(1)	(1)	0	0	10,000	0	5 funnels observed in vicinity of Millarton and Ypsilanti; 2 reached ground, destroying 4 barns.
5. May 30	Afternoon	Stutsman								
6. May 30	Afternoon	Stutsman								
7. May 30	Afternoon	Stutsman								
8. May 30	Afternoon	Stutsman								
9. June 13	Late afternoon	Williams	E	10	(1)	0	0	1,000	0	2 funnels observed north of Williston; 1 touched ground and damaged school and township hall 12 miles east of Williston.
10. June 13	Late afternoon	Williams								
11. June 13	Late afternoon	Bottineau	SE	(1)	(1)	0	0	0	0	Funnel cloud observed east of Mohall; appeared to strike ground; no reports of damage received.
12. June 27	Afternoon	Traill	(1)	(1)	(1)	0	0	(5)	0	4 funnels observed near Cummings; 1 struck ground with minor damage.
13. June 27	Afternoon	Traill								
14. June 27	Afternoon	Traill								
15. June 27	Afternoon	Traill								
16. June 27	Afternoon	Barnes	(1)	(1)	(1)	0	0	0	0	Funnel cloud reported southeast of Valley City apparently caused no damage.
17. July 6	8 p.m.	Wells	SE	(1)	(1)	0	0	62,000	0	All buildings in tornado path damaged and 3 garages a total loss as tornado cut through center of Hurdsville.
18. July 11	Afternoon or evening	Walsh	(1)	(1)	(1)	0	0	0	0	Tornado cloud did not reach ground; sighted over Park River.
OHIO										
1. Apr. 15	6-6:15 p.m.	Clermont	NE	2	33	0	0	8,000	600	In Lindale-Mt. Holly area. Small tornado overturned chicken house, destroyed 3 garages, shifted residence off its foundation, damaged farm machinery, destroyed many apple trees and bee hives.
2. June 8	7-9:30 p.m.	Wood, Sandusky, Erie, Lorain, and Cuyahoga	ENE	100	440-1760	17	400	17,000,000	3,000,000	Tornado destroyed and damaged buildings, cattle, and crops. Hail 1/4 to 1 1/4, few 1 1/2 inches in diameter. Major damage by tornado in Cleveland area.
3. June 13	12:45 p.m.	Preble	NE	(1)	42	0	0	20,000	500	Small area, 2 miles west of Eaton. Destruction confined to empty buildings and barns.
OKLAHOMA										
1. Feb. 19	7:40 p.m.	Garvin	NE	1 1/4	17	0	0	1,000	0	7 miles south of Lindsay.
2. Feb. 19	9-9:15 p.m.	Love	NE	1/2	440	0	0	2,000	0	8 miles southeast of Marietta.
3. Feb. 19	9:15-9:35 p.m.	Murray	NE	4	67	0	0	1,000	0	3 miles south to 3 miles east of Sulphur. Funnel observed.
4. Feb. 19	9:45 p.m.	Marshall	(1)	(1)	(1)	0	0	500	0	Farm outbuildings on adjacent farmsteads destroyed 1/2 mile south and 1 mile east of Willis.
5. Feb. 19	9:50 p.m.	Coal	NE	1	200	0	0	3,000	0	South edge of Coalgate. Funnel observed.
6. Mar. 13	5:15-5:35 p.m.	Grady	NNE	25	100	0	1	45,000	0	Funnel observed. Path about 2 miles long in Rush Springs area, then lifted and came down again southwest of

See reference notes at end of table.



# TORNADO DATA

Table 11—Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
OKLAHOMA(Cont'd)										
7. Mar. 13	6:19-6:29 p.m.	Grady	NNE	1	80-120	1	8	250,000	0	Blanchard. Accompanied by hail with about \$5,000 hail damage(not included in total).
8. Mar. 13	6:15-7 p.m.	McClain	NNE-N	2	75-100	0	2	200,000	0	Struck Bradley; passed over in about a minute. No rain until about 15 to 20 minutes afterward.
9. Mar. 13	7:30 p.m.	Cleveland	NE	1 1/4	250	0	0	1,600	0	Struck Washington. Because of warnings virtually every resident was able to get to basements or cellars.
10. Mar. 13	8:30-9p.m.	Love, Carter, and Johnston	NE	50	75-300	2	11	20,000	0	Struck 10 1/2 miles east and 1 1/2 miles south of Norman.
11. Mar. 13	10-10:30 p.m.	LeFlore	(1)	(6)	100	0	0	2,200	0	From southern Love County to north of Tishomingo in Johnston County.
12. Mar. 26	9 p.m.	Bryan	(1)	(1)	(1)	0	0	0	0	Principal damage in Dickson and Mannsville communities.
13. Mar. 29	7:25-8:10 p.m.	Comanche	(1)	1	100	0	0	600	0	2 miles west of Monroe.
14. Apr. 2	9:58-10:12 p.m.	Garvin	NE	(1)	(1)	0	0	0	0	Funnel observed above the ground near Bokchita.
15. Apr. 14	6:50-7:30 p.m.	Canadian and Grady	SE-ESE	18	440	0	0	300,000	0	Observed 6 miles northwest of Lindsay.
16. Apr. 14	11 p.m.	Atoka	(1)	1/4	25	0	0	1,000	0	From 5 miles southwest of Yukon to 8 miles east of Tuttle. Accompanied by heavy hail.
17. Apr. 23	3:31-4:10 p.m.	Okmulgee	E	1 1/2	300	1	4	7,000	0	Struck Tushka School southwest of Atoka.
18. Apr. 23	8 p.m.	McCurtain	ENE	1	200	0	1	100,000	0	Struck 1 mile west of Bryant.
19. Apr. 23	8:10 p.m.	McCurtain	NE	(1)	(3)	0	0	2,000	0	Struck Idabell.
20. Apr. 23	8:30 p.m.	McCurtain	NE	3/4	17	1	14	25,000	0	Struck Mt. Zion community south of Valliant.
21. Apr. 28	3 p.m.	Woodward	(1)	(6)	(3)	0	0	0	0	Struck south edge of Eagletown.
22. Apr. 28	4:15 p.m.	Pushmataha	NE	200	100	0	0	200	0	Funnel observed as it moved over open ranch land north of Woodward.
23. May 10	1 a.m.	Harmon	NE	3	440	0	0	1,000	0	25 miles northeast of Antlers.
24. May 10	(1)	Greer	(1)	(6)	(3)	0	0	1,000	0	1 mile southeast of Vinson.
25. May 10	1:15 a.m.	Greer	NE	(6)	17	0	0	5,000	0	22 miles southwest of Mangum.
26. May 10	1:20 a.m.	Custer	(1)	(6)	(3)	0	0	500	0	Near Mangum.
*27. May 10	3 a.m.	Grant	(1)	(6)	(3)	0	0	(5)	0	1/2 mile north of Thomas.
28. May 11	4:30 p.m.	Garvin	NE	2	33	0	0	500	0	Extreme northern part of County; crossed into Kansas.
29. May 11	Afternoon	Pittsburg	(1)	(6)	(3)	0	0	(5)	0	North-northeast of Wynnewood.
30. May 18	(1)	Carter	(1)	(6)	(3)	0	0	(5)	0	Northwest of McAlester.
31. June 5	3:30 p.m.	Blaine	NE	500	100	0	0	100	0	South of Ardmore.
32. June 5	4:15-4:30 p.m.	Kiowa	SE	(1)	200	0	0	0	0	Near Canton Lake. Accompanied by an electrical storm with an additional \$150 electrical loss.
33. June 5	5 p.m.	Noble	(1)	(1)	(1)	0	0	0	0	South of Mountain View.
34. June 5	Late afternoon	Harmon	(1)	(1)	(1)	0	0	0	0	Tornado cloud observed not reaching ground, west of Perry.
35. June 5	7 p.m.	Noble	(1)	(1)	(1)	0	0	0	0	West of Vinson. Funnel observed in sky by many persons; did not reach ground.
36. June 5	8:20 p.m.	Washington	(1)	2	50	0	0	3,000	0	Tornado cloud observed not reaching ground, southwest of Perry.
37. June 5	9:15 p.m.	Garvin and Murray	SE	15	(3)	0	0	50,000	0	2 1/2 miles northeast of Dewey.
38. June 5	9:45-10:15 p.m.	Pontotoc	ENE	(6)	(3)	0	0	60,000	0	From Wynnewood to north of Sulphur.
39. June 6	8:20-10 p.m.	Grant	NE	(1)	(1)	0	0	0	0	From Roff to Fitzhugh to Stonewall.
40. June 6	10 p.m.	Roger Mills	(1)	(1)	(1)	0	0	600	0	Funnel did not touch ground. Observed near Jefferson.
41. June 19	Noon	Woods	(1)	(6)	(3)	0	0	1,600	0	Northeast of Cheyenne.
42. June 19	5:20 p.m.	Stephens	(1)	1/4	50	0	1	300	0	Between Carmen and Dacoma.
43. June 19	5:30 p.m.	Gray	NE	5	880	0	0	25,000	0	South of Duncan.
44. June 22	Late evening	Beaver	(1)	1	300	0	0	300	0	Southwest of Chickasha.
45. June 23	12:44-1:15 a.m.	Ellis	(1)	(1)	(1)	0	0	0	0	12 miles southwest of Beaver.
46. June 24	(1)	Noble	N	210	10	0	0	2,000	0	Funnel observed by observers at Gage Airport.
47. July 6	5 p.m.	Lincoln	NE	400	100	0	0	3,000	0	Northeast of Billings.
48. July 6	5:25-6 p.m.	Okmulgee	(1)	1	220	0	0	500	0	3 miles north of Stroud.
49. July 7	5-5:15 p.m.	Garvin	SE	1	440	0	0	0	0	1 mile southeast of Okmulgee. Accompanied by hail and high winds.
50. July 7	5-5:25 p.m.	Beckham	NE	(1)	(1)	0	0	5,000	0	Funnel observed by many persons at Maysville.
51. July 8	3:40-5:30 p.m.	Kay	SE	(1)	(1)	0	0	5,000	0	Near Mayfield.
52. July 8	3:40-5:30 p.m.	Kay	SE	(1)	(1)	0	0	5,000	0	3 funnels observed in the cloud, 3 miles west of Ponca City Airport.
53. July 8	3:40-5:30 p.m.	Kay	SE	(1)	(1)	0	0	5,000	0	
54. July 16	1:10 p.m.	Grady	NE	(1)	(1)	0	0	0	0	A good sized funnel, 5 to 6 miles northwest of Tuttle.

See reference notes at end of table.

# TORNADO DATA

Table 11—Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
OKLAHOMA (Cont'd)										
55. Aug. 4	4:28-4:53 p.m.	Kiowa	E	(6)	(3)	0	0	4,500	0	Near Hobart.
56. Aug. 11	4:55-7:10 p.m.	Kiowa	(1)	(6)	(3)	0	0	3,500	0	2 miles south of Lone Wolf.
57. Nov. 18	10:40p.m.	Canadian	(1)	2 1/2	17	0	0	500	0	2 1/2 miles east of El Reno; damage to buildings.
58. Nov. 19	8:25-8:39 a.m.	Kay	NE	(6)	(3)	0	0	0	0	Struck ground in open wheat field near Maulk Airport, Blackwell.
59. Nov. 19	10:20-10:30 a.m.	Murray	(1)	2	33	0	0	15,000	0	Occurred at Sulphur.
60. Nov. 19	11 a.m.	Muskogee	NE	(6)	(3)	0	0	1,300	0	Occurred at Muskogee.
61. Dec. 2	7:30-9 p.m.	Carter and Murray	NE	35	880	0	2	5,000	0	Believed to be a single tornado, dipping to the ground at times over a 35 mile long path from 3 1/2 miles west of Ardmore to 4 miles south of Sulphur to 3 1/2 miles northeast of Sulphur.
62. Dec. 2	9:30-10 p.m.	Pottawatomie	NE	1 1/2	880	0	1	4,000	0	Occurred at Shawnee.
OREGON										
(None reported)										
PENNSYLVANIA										
1. May 23	11:10a.m.-12:10p.m.	Schuylkill	ENE	1/2	25	0	0	3,500	600	Valley View area. Damaged buildings and crops.
2. May 30	9 p.m.	Indiana-Westmorland Border	ESE	(1)	(1)	0	0	(4)	C	Blairsville-Bolivar area. Garage blown apart; roofs, chimneys, trees, and wires damaged.
3. June 22	12:30-1 p.m.	Chester	E	3	15	0	0	(4)	C	Honeybrook area. Several baby tornadoes with funnel-shaped black clouds occurred just east of here. Barn unroofed, chimney felled, other buildings, crops, orchards, and wires damaged.
4. June 22	12:30-1 p.m.	Chester								
5. July 9	Daytime	Over Lake Erie	(1)	(1)	(1)	0	0	(4)	(4)	Waterspout over Lake Erie, about 15 miles northeast of Erie.
6. Aug. 8	7-7:45 p.m.	Franklin-Cumberland Border	NNE	-	-	0	2	(4)	(4)	Shippensburg area. Large thunderstorm with incipient tornado action. General 65-75 m.p.h. gusts for 45 minutes over circle of 2 mile radius. Small school felled; 13 trailers damaged; other buildings, crops, and wires damaged.
7. Aug. 9	Daytime	Over Lake Erie	(1)	(1)	(1)	0	0	(4)	(4)	Waterspout over Lake Erie, east of Erie.
8. Sept. 12	5:30-7p.m.	Dauphin-Schuylkill Border	SE	5	50	0	0	4,000	0	Klingerstown area. Hit-skip path. Unroofed barns and sheds; damaged a car, other buildings and utility lines.
9. Nov. 22	7:30 p.m.	Erie	NE	2	65	0	2	60,000	C	Corry area. West end of city had 2 houses severely damaged, others had variable damage; 3 cars damaged, scores of trees uprooted or broken, utility lines felled.
10. Nov. 23	2 a.m.	Lancaster	NE	(1)	170	0	0	2,000	0	Landisville area. Small tornado action in thunderstorm. 2 houses damaged.
RHODE ISLAND										
(None reported)										
SOUTH CAROLINA										
1. Jan. 8	5:15 p.m.	Florence	NE	8	50-100	0	2	60,000	0	Moved from 3 miles south of Effingham to point just southwest of Claussen.
2. May 2	6 p.m.	Sumter	(1)	(1)	(1)	1	0	6,000	0	Near Sumter. No tornadic formation seen, but type of damage warrants assumption of tornadic action.
3. May 31	7 p.m.	Colleton	NE	8-10	65-130	0	0	3,500	0	At Cottageville.
4. June 1	4-5 p.m.	Orangeburg	(1)	(1)	(1)	0	1	35,000	65,000	In Pine Hill-Bolentown section.
5. Aug. 7	2:30-3 a.m.	Georgetown	W	5	100	0	0	35,000	0	At Georgetown.
6. Aug. 19	Noon-12:15 p.m.	Charleston	SW	(1)	(1)	0	0	0	0	Well-formed waterspout sighted at Sullivan's Island. The base was about 100 feet in diameter.
SOUTH DAKOTA										
1. May 9	6:05 p.m.	Beadle	NE	3	440	0	0	8,000	0	North of Huron. Buildings in path twisted in manner which showed evidence of small tornado. Airplane hangar, large barn, smaller buildings damaged.
2. May 9	7 p.m.	Clark and Hamlin	NNE	9	150	0	0	12,000	0	Cherry Lake to Vienna. Buildings on 6 farms known to have been damaged.

See reference notes at end of table.



## TORNADO DATA

Table 11—Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
SOUTH DAKOTA (Cont'd)										
3. May 10	12:05 p.m.	Lincoln	NE	(1)	(1)	0	0	0	0	Observed by "skywatcher" army filter center at Lennox and others. Did not touch ground while visible to observers.
*4. May 28	8 p.m.	Pennington	NE	(1)	(1)	0	0	(4)	(4)	Newcastle, Wyo., to Rochford, S.Dak. 1/4-inch hail accompanied tornado. 50,000 board feet timber destroyed, also roofs and windows in Rochford.
5. May 29	3:45 p.m.	Corson	NE	1/2	90	0	2	100,000	0	At McLaughlin, business buildings, 2 homes, school building, and cars destroyed or damaged.
6. May 29	7:30 p.m.	Clark and Codington	NE	(1)	(1)	0	0	(5)	(5)	70 to 80 m.p.h. wind destroyed buildings and machinery. Funnel cloud seen at Conde and Wallace.
7. May 29	10 p.m.	Clark	NE	15	(3)	0	0	10,000	0	Buildings on 5 farmsteads destroyed near Willow Lake.
8. June 2	5 p.m.	Dewey	NE	6	(3)	0	0	T50,000	C	At Eagle Butte, grain elevator, 2 airplanes, 2 hangars, several large barns, small buildings, power lines, and roof of lumber yard damaged.
9. June 7	5:45 p.m.	Davison	N	1 1/2	(3)	0	0	0	0	Funnel cloud sighted 10 miles north of Mitchell in open country.
10. June 14	4 p.m.	Washabaugh	NE	20	440	0	0	5,000	0	In path from Longvalley to Belvidere small buildings were destroyed.
11. June 15	4 p.m.	Day	NE	4	(3)	0	0	3,000	0	A barn, small buildings, and porch of house damaged at Andover.
12. June 18	11:45 p.m.	McCook	NE	3	70	0	0	T400	C	Small tornado damaged trees, small buildings, and crops at Bridgewater.
13. Aug. 4	5:40 p.m.	Lawrence	SE	2	50	0	0	200	0	Pictures taken at Spearfish show well-defined large tornado in open country. Airplane damaged at airport.
TENNESSEE										
1. Jan. 20	5:41 p.m.	Warren	NE	1/2	500	0	0	22,000	0	1 home damaged, 5 barns destroyed, 3 airplanes smashed at Bethany community, near McMinnville.
2. Mar. 14	5:45-6:05 p.m.	Haywood	NE	25	35	0	8	10,000	0	2 homes destroyed, 3 damaged, 7 farm buildings destroyed, and 14 damaged at Brownsville.
3. Mar. 14	6 p.m.	Henderson	NE	25	100	0	1	50,000	0	2 homes destroyed and 20 damaged, 8 buildings destroyed and 15 damaged in the vicinity of Henderson.
4. Mar. 14	6:30 p.m.	Dyer	NE	(1)	(1)	0	0	30,000	0	In Newbern and Dyersburg areas.
5. Mar. 14	7-8 p.m.	Madison	NE	25	100	0	2	40,000	0	4 homes destroyed and 5 damaged, 12 farm buildings destroyed and 5 damaged at Jackson.
6. Mar. 14	7 p.m.	Lauderdale	NE	(1)	(1)	0	0	10,000	0	11 homes and 2 farm buildings damaged near Ripley.
7. Mar. 14	9:15 p.m.	Weakley	NE	1/4	600	0	1	10,000	0	5 homes damaged, 3 farm buildings destroyed and 8 damaged in Martin-Dresden section.
8. Mar. 22	3:15 p.m.	Dyer	NE	30	100	0	0	150,000	0	Many homes and other buildings damaged in Newbern and Dyersburg areas.
9. May 2	3-3:30 a.m.	Anderson and Knox	NE	(1)	330	0	2	5,000	0	4 homes destroyed and 4 others damaged, 2 farm buildings damaged southeast of Oak Ridge Reservation.
10. May 2	4 a.m.	Meigs and McMinn	NE	18	575	4	8	168,000	3,000	3 homes destroyed and 58 damaged, 55 farm buildings destroyed and 89 damaged in vicinity of Decatur.
11. May 14	(1)	Lincoln	NE	(1)	(1)	0	0	(5)	(4)	Property damage slight in southern part of County.
TEXAS										
1. Feb. 19	Afternoon	Houston	NE	(1)	(1)	0	0	40,000	0	Homes at Pearson Chapel, Pine Hill, Hopewell, and trees in Davey Crockett National Forest damaged.
2. Feb. 19	5:30 p.m.	Nacogdoches	(1)	(1)	(1)	0	0	(4)	0	10 homes, a church, and several barns at Nat damaged.
3. Mar. 12	4:50 p.m.	Panola	NE	2	400	0	3	50,000	0	Damage to buildings and automobiles at Carthage.
4. Mar. 13	2 p.m.	Haskell and Knox	NNE	18	500	17	25	600,000	0	33 homes destroyed, 139 homes damaged, and 43 other buildings damaged at Judd, O'Brien, and Knox City.
5. Apr. 28	6:45 p.m.	Bastrop	(1)	1/2	200	0	3	15,000	0	1 home destroyed, 15 others damaged at Smithville.
6. Apr. 28	8:05 p.m.	Bexar	ENE	10	200-300	0	7	100,000	0	2 homes destroyed, 17 damaged seriously at Helotes.
7. Apr. 28	8:45 p.m.	Bexar	NE	5	150-250	1	5	75,000	0	Homes destroyed and other property damage 3 miles north of San Antonio Airport.
8. May 11	2:15 p.m.	Tom Green	E	2	880	11	159	3,239,000	0	Lake View district, 4 miles north of San Angelo; 320 homes destroyed, 199 homes damaged.

See reference notes at end of table.

# TORNADO DATA

Table 11--Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks	
						Killed	Injured	Property (exclusive of crops)	Crops		
TEXAS (Cont'd)											
9. May 11	4:10 p.m.	McLennan	NE	23	660	114	597	39,500,000	1,650,000	150 homes destroyed; 900 homes damaged; 185 other buildings destroyed, including 6-story furniture company in downtown Waco.	
10. May 11	6:30 p.m.	Leon	NE	12	300	0	3	48,000	(5)	Some light hail. 1 home destroyed, 11 damaged, and 7 other buildings destroyed or damaged. 5 miles southwest of Jewett.	
11. May 11	(1)	Fisher	(1)	(1)	(1)	0	0	0	0	Several funnel-shaped clouds observed at Rotan; none touched ground.	
12. May 11	(1)	Fisher	N	5	(1)	1	3	(4)	(4)	7 miles southwest of Crockett at Porter Springs community, then moved to Wesley Chapel. 12 homes destroyed, 18 damaged; 38 other buildings damaged or destroyed.	
13. May 16	2:30 p.m.	Houston									
14. May 16	3 p.m.	Cherokee	(1)	(1)	(1)	0	0	T50,000	C		Principal damage to outbuildings, trees, and utility lines. Some crop damage.
15. May 18	(1)	Nueces	(1)	(1)	(1)	0	0	0	0		Funnel observed at Corpus Christi; did not touch ground.
16. May 31	9 p.m.	Swisher	(1)	(1)	(1)	0	0	(5)	(5)	Barns damaged and destroyed.	
17. June 5	1:30 p.m.	Collingsworth	(1)	(1)	(1)	0	0	(4)	(4)	Cotton and other crops destroyed; roofs damaged. 3 tornado clouds observed in vicinity of Wellington; 1 touched ground.	
18. June 5	1:30 p.m.	Collingsworth	(1)	(1)	(1)	0	1	(5)	(5)	Small building destroyed, causing damage to nearby buildings.	
19. June 5	1:30 p.m.	Collingsworth									
20. June 19	5:30 p.m.	Wichita									
21. July 1	(1)	Harris	(1)	(1)	(1)	0	0	0	0		Ellington Air Force Base reported small tornado; did not touch ground.
22. July 15	1:30 p.m.	Cameron	(1)	(1)	(1)	0	0	(5)	(5)	2 small buildings destroyed and 2 damaged at Combes.	
23. July 15	(1)	Coke	(1)	(1)	(1)	0	0	(4)	(4)	5 homes unroofed; school wrecked. 8 miles west of Robert Lee.	
24. July 27	10:28 a.m.	Matagorda	W	(1)	(1)	0	0	0	0	Funnel east-southeast of Palacios; did not touch ground.	
25. July 28	10:15 a.m.	Nueces	(1)	1	67	0	0	0	0	Confirmed by WBAS, Corpus Christi.	
26. Aug. 4	4 a.m.	Cottle	(1)	(1)	(1)	0	0	0	0	Funnel sighted 2 miles east of Paducah; did not touch ground.	
27. Aug. 4	(1)	Nolan	S	(1)	(1)	0	0	0	0	Tornado cloud sighted at Roscoe; did not touch ground.	
28. Aug. 11	5:45 p.m.	Knox	(1)	(1)	(1)	0	0	0	100	Occurred at Knox City.	
29. Aug. 11	7 p.m.	Wichita and Clay	NE	3	1760	0	0	50,000	0	In Wichita Falls and surrounding area 1 or 2 homes destroyed, several damaged; oil field property damaged.	
30. Aug. 15	2:50 p.m.	Harris	N	(1)	35	0	0	4,000	0	Rice crop damage by high wind. Small buildings and cars damaged by tornado at Baytown.	
31. Aug. 21	11:44 a.m.	San Patricio	(1)	(1)	(1)	0	0	0	0	Pilot reported tornado cloud 5 miles north of Edroy; did not touch ground.	
32. Aug. 21	1:20 p.m.	Matagorda	(1)	(1)	(1)	0	0	0	0	Pilot reported cloud about 15 miles south of Palacios; did not touch ground.	
33. Aug. 24	1:06 p.m.	Wichita	(1)	(1)	(1)	0	0	0	0	Sheppard Airfield confirmed tornado 1 1/2 miles north of station; did not touch ground.	
34. Aug. 30	(1)	Nueces	(1)	(1)	(1)	0	0	0	0	Weak-tornado waterspout observed, 1/2 mile south of Corpus Christi by WBAS.	
35. Aug. 31	8:25 p.m.	Nueces	(1)	(1)	(1)	0	0	(5)	(5)	Minor damage reported 8 miles south of Agua Dulce.	
36. Aug. 31	8:55 p.m.	Kimble	(1)	(1)	(1)	0	0	0	0	Tornado struck ranch land near Junction. Confirmed by Highway Department.	
37. Oct. 23	2 a.m.	Travis	(1)	1/2	100	0	0	15,000	0	West of Austin city limits near Oakhill.	
38. Oct. 23	3:15 p.m.	Nueces	SSE	4	100	0	0	7,000	0	Autos damaged; 2 homes damaged; utility lines and poles damaged. At Port Aransas.	
39. Oct. 31	8:30 a.m.	Victoria	(1)	(1)	(1)	0	0	0	0	Unconfirmed tornado 4 miles southwest of WBAS at Victoria; did not touch ground.	
40. Nov. 19	12:50 p.m.	Anderson	N	(1)	50	0	0	9,900	0	Palestine Airport hangar and shop damaged. Several homes damaged.	
41. Dec. 1	5:45 p.m.	Bexar	(1)	(1)	(1)	0	0	0	0	3 funnel clouds observed; did not touch ground. Observed 10 miles west of Sequin.	
42. Dec. 1	5:45 p.m.	Bexar	NNE	5	1760	0	10	53,000	0	7 miles south of Seguin; 7 homes destroyed, 7 damaged.	
43. Dec. 1	5:45 p.m.	Bexar									
44. Dec. 1	7 p.m.	Guadalupe									
45. Dec. 2	6:15 a.m.	Lee	NE	1/2	100	0	4	50,000	0		Damage to homes and city and church property at Tanglewood.
46. Dec. 2	10:30 a.m.	Wharton	N	1 1/2	200	0	0	5,000	0	Damage to farm homes near Lane City.	
47. Dec. 2	1:35 p.m.	Washington	(1)	(1)	50	2	5	500	0	Homes damaged 6 miles west of Navasota.	
48. Dec. 2	2:45 p.m.	Angelina	(1)	3	100	0	0	1,800	0	5 homes damaged at Pollok.	
49. Dec. 2	3 p.m.	Brazos	NE	(1)	(1)	0	0	(4)	0	1 home completely destroyed near Bryan Air Force Base.	

See reference notes at end of table.



# TORNADO DATA

Table 11--Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
UTAH										
1. June 5	9 a.m.	Davis	ENE	10	440	0	0	(5)	0	At Farmington Canyon, 18 miles north of Salt Lake City. Did not reach ground in populated areas.
VERMONT										
1. June 21	6-6:10 p.m.	Franklin	NE	1 1/2	(1)	0	0	800	0	"Very black cloud with a small funnel". Small tornado swept through area near Champlain Country Club on Swanton Road in St. Albans. It moved 5-car garage off its foundation and unroofed a barn about a mile away.
VIRGINIA										
1. Apr. 30	6:45 p.m.	Washington	E	1/2	220	0	0	1,000	0	Damage confined to building within a small area, near Abingdon.
2. May 2	7:45-8 p.m.	Greenville	E	2	100	0	0	7,500	0	Brink area south of Emporia.
3. May 17	2:30-3:30 p.m.	Fauquier	E	6	(1)	0	0	3,000	0	Tornado formed at Marshall and moved through Zulla to near Halfway.
4. May 17	5:30-6:30 p.m.	Roanoke	SE	1/2	400	0	0	8,000	0	Buildings damaged near Starkey. Several hundred trees wrung off 10 to 20 feet above ground and several large trees uprooted.
5. June 10	2:30-3 p.m.	Washington	(1)	(1)	(1)	0	0	(5)	(5)	Occurred at Mendota.
6. June 13	4 p.m.	Pittsylvania	(1)	(1)	(1)	0	0	(5)	(5)	Occurred at Danville.
WASHINGTON										
(None reported)										
WEST VIRGINIA										
(None reported)										
WISCONSIN										
1. May 10	6:30-8 p.m.	Pierce, St. Croix, Polk, Burnett, Washburn, and Douglas	NNE	100	100	4	27	1,000,000	(5)	First observed at River Falls, Pierce County. 1 death in St. Croix County, 2 in Polk, and 1 in Burnett. Moved through rural area. 12 homes destroyed and 101 homes damaged; 127 farm buildings destroyed and 88 damaged.
*2. May 10	6:30-8 p.m.	Buffalo, Trempealeau, Eau Claire, Chippewa, Taylor and Price	NE	100	100	0	10	1,000,000	(5)	Apparently crossed river from Minnesota. 3 homes destroyed and 47 homes damaged; 114 farm buildings destroyed and 50 damaged. Moved through rural area.
3. June 20	P.m.	Oneida	(1)	(6)	(1)	0	0	30,000	0	Destroyed 1,000,000 board feet of timber near Three Lakes.
WYOMING										
*1. May 28	7 p.m.	Weston	NE	14	440	0	0	50,000	1,000	Occurred near Newcastle. Hit several ranches in area, but missed all populated areas. Principal damage confined to ranch buildings, metal granaries, fences, and communication lines. Some damage resulted from hail following tornado.
2. May 29	1 p.m.	Sheridar	E	(1)	(1)	0	0	0	0	Storm occurred east of Sheridan over open range country.
3. June 11	3 p.m.	Campbell	(1)	8	(1)	0	0	4,000	(5)	Some buildings moved from foundations and roofs damaged at Keeline.
4. June 12	5 p.m.	Niobrara	(1)	2	1760	0	0	2,500	5,000	In Lawver area. Some damage to buildings.
5. July 2	6 p.m.	Platte	(1)	(1)	(1)	0	0	(5)	0	Tornado occurred 2 miles southeast of Chugwater.
6. July 16	Afternoon	Albany	(1)	(1)	(1)	0	0	(5)	0	Storm high in Medicine Bow Mountains and only damage was to growing trees.
7. July 24	Afternoon	Goshen	(1)	(1)	(1)	0	0	(5)	0	Large tree uprooted on farm, 4 miles northwest of Lingle.
8. Aug. 10	5:15 p.m.	Laramie	(1)	(1)	(1)	0	0	0	(5)	Funnel sighted near Tennyson, but due to fact that storm occurred over range country, only light damage resulted.
9. Aug. 14	4:28 p.m.	Laramie	(1)	(1)	(1)	0	0	0	0	Pilot reported funnel cloud 20 miles north-northwest of Cheyenne. Funnel failed to reach ground.
ALASKA										
(None reported)										

See reference notes at end of table.

# TORNADO DATA

Table 11--Continued

Year 1953

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
HAWAII (None reported)										
WEST INDIES (None reported)										

- \* Denotes State-boundary crossing tornadoes.
- C Damage to crops.
- T Includes crop damage.
- 1 Datum not obtained.
- 2 Yards instead of miles.
- 3 Narrow.
- 4 Losses occurred; amount not reported.
- 5 Amount of damage described as small; no definite monetary estimate.
- 6 Short.



# TORNADO SUMMARY

Table 12

Year 1953

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
ALABAMA													
Number	5	4	3	4	6			3				2	27
Days	3	1	2	3	2			1				1	13
Deaths	0	1	0	16	9			0				0	16
Injuries	2	17	2	207	19			0				1	248
Damage	80,000	95,000	38,000	5,042,000	277,000			0				17,000	5,549,000
ARIZONA (None)													
ARKANSAS													
Number	1	1	3	2	1		1					1	10
Days	1	1	1	2	1		1					0	8
Deaths	0	0	0	0	0		0					0	0
Injuries	2	0	7	0	0		0					0	9
Damage	3,000	1,000	244,000	15,000	10,000		(1)					167,000	244,000
CALIFORNIA													
Number				1									1
Days				1									1
Deaths				0									0
Injuries				0									0
Damage				7,000									7,000
COLORADO													
Number						6	4	3	1	2			16
Days						2	2	2	1	1			8
Deaths						0	0	0	0	0			0
Injuries						0	0	0	0	0			0
Damage						1,700	(3)	20,000	3,000	19,000			243,700
CONNECTICUT (None)													
DELAWARE (None)													
DISTRICT OF COLUMBIA (None)													
FLORIDA													
Number	3		3	3	2	5	1	7	6	1	2	4	37
Days	1		1	3	2	4	1	5	3	1	2	4	27
Deaths	0		0	0	0	0	0	0	0	0	0	0	0
Injuries	12		0	0	0	0	1	0	0	0	22	0	35
Damage	247,000		0	(1)	3,000	5,000	(1)	(1)	0	3,000	20,000	160,000	238,000
GEORGIA													
Number	2			9								1	12
Days	1			2								1	4
Deaths	0			22								0	22
Injuries	2			613								0	615
Damage	12,600			30,673,500								36,500	30,722,500
IDAHO (None)													
ILLINOIS													
Number			1	2	2		1						6
Days			1	1	1		1						4
Deaths			0	1	0		0						1
Injuries			0	13	0		0						13
Damage			75,000	2,280,000	0		0						2,355,000
INDIANA													
Number			4	1		1							6
Days			2	1		1							4
Deaths			0	2		0							2
Injuries			0	12		0							12
Damage			20,500	1,000,000		500							1,021,000
IOWA													
Number			4	1	8	10							23
Days			1	1	3	2							7
Deaths			0	0	1	1							2
Injuries			2	0	12	5							19
Damage			156,500	(1)	1,490,000	1,668,000							3,314,500
KANSAS													
Number			1	9	14	20		6					52
Days			1	3	6	7		4	1				22
Deaths			0	0	0	0		0	0				0
Injuries			0	0	1	0		0	0				1
Damage			0	0	140,800	24,500	5,000	16,100					216,400
KENTUCKY (None)													
LOUISIANA													
Number	1	1	1	3	8		1			1	2	4	20
Days	1	1	1	1	4		1			1	1	2	12
Deaths	2	2	2	0	0		0			0	0	9	13
Injuries	21	22	22	0	23		2			0	2	80	150
Damage	929,000		760,000	5,500	2590,000		50,000			4,000	255,000	561,500	3,155,000
MAINE													
Number						1	1						2
Days						1	1						2
Deaths						0	0						0
Injuries						0	1						1
Damage						500	(1)						500
MARYLAND													
Number					1		1						2
Days					1		1						2
Deaths					0		0						0
Injuries					0		0						0
Damage					23,500		(1)						23,500
MASSACHUSETTS													
Number						2							2
Days						1							1
Deaths						90							90
Injuries						1,305							1,305
Damage						52,874,000							52,874,000
MICHIGAN													
Number					3	11	2		1				17
Days					3	4	2		1				10
Deaths					2	125	0		0				127
Injuries					68	914	0		0				982
Damage					2,503,000	20,807,900	2,500		0				23,313,400

See reference notes at end of table.

Table 12—Continued

## TORNADO SUMMARY

Year 1953

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
MINNESOTA													
Number			1		7	2	2	5					17
Days			1		1	2	2	1					7
Deaths			1		8	0	0	0					9
Injuries			0		20	0	1	0					21
Damage			50,000		✓2635,000	✓40,000	✓100,000	(3)					✓825,000
MISSISSIPPI													
Number	1	4	4	3	5			2				3	22
Days	1	1	3	3	2			2				2	14
Deaths	0	0	1	0	0			0				38	39
Injuries	✓1	✓2	✓1	0	✓4			0				301	✓309
Damage	✓110,000	✓50,000	✓994,000	73,000	138,000			8,500				25,535,500	26,909,000
MISSOURI													
Number			3		2			2					7
Days			2		2			2					6
Deaths			0		0			0					0
Injuries			1		0			0					1
Damage			12,500		6,000			✓5,000					✓23,500
MONTANA													
Number					3	4	3						10
Days					1	2	2						5
Deaths					0	0	0						0
Injuries					0	✓1	0						✓1
Damage					10,000	✓50,000	(3)						✓60,000
NEBRASKA													
Number				2	12	27	8	2					51
Days				1	6	6	6	2					21
Deaths				0	5	11	0	0					16
Injuries				0	✓62	✓9	✓0	0					✓71
Damage				1,700	2,510,700	✓536,800	✓7,400	✓1,200					✓3,057,800
NEVADA													
Number					5								5
Days					1								1
Deaths					0								0
Injuries					0								0
Damage					0								0
NEW HAMPSHIRE													
Number						2							2
Days						1							1
Deaths						0							0
Injuries						5							5
Damage						100,300							100,300
NEW JERSEY													
(None)													
NEW MEXICO													
(None)													
NEW YORK													
(None)													
NORTH CAROLINA													
Number			1	2									3
Days			1	2									3
Deaths			0	0									0
Injuries			1	0									1
Damage			100,000	24,000									124,000
NORTH DAKOTA													
Number					8	8	2						18
Days					2	2	2						6
Deaths					2	0	0						2
Injuries					20	0	0						20
Damage					103,000	✓1,000	62,000						✓166,000
OHIO													
Number				1		2							3
Days				1		2							3
Deaths				0		17							17
Injuries				0		400							400
Damage				8,600		20,020,500							20,029,100
OKLAHOMA													
Number		5	8	8	8	16	8	2			4	2	62
Days		1	3	3	3	6	4	2			2	1	26
Deaths		0	2	0	0	0	0	0			0	0	5
Injuries		0	22	19	0	1	0	0			0	0	✓45
Damage		7,500	519,400	435,200	✓8,000	142,900	13,500	8,000			16,800	9,000	✓1,160,300
OREGON													
(None)													
PENNSYLVANIA													
Number					2	2	1	2	1		2		10
Days					2	1	1	2	2		2		9
Deaths					0	0	0	0	0		0		0
Injuries					0	0	0	2	0		2		4
Damage					✓4,100	(1)	(1)	(1)	4,000		✓62,000		✓70,100
RHODE ISLAND													
(None)													
SOUTH CAROLINA													
Number	1				2	1		2					6
Days	1				2	1		2					6
Deaths	0				1	0		0					1
Injuries	2				0	1		0					3
Damage	60,000				9,500	100,000		35,000					204,500
SOUTH DAKOTA													
Number					7	5		1					13
Days					4	5		1					10
Deaths					0	0		0					0
Injuries					✓2	0		0					✓2
Damage					✓130,000	58,400		200					✓188,600
TENNESSEE													
Number	1		7		3								11
Days	1		2		2								5
Deaths	0		0		4								4
Injuries	0		12		10								✓22
Damage	22,000		300,000		✓176,000								✓498,000

See reference notes at end of table.



# TORNADO SUMMARY

Table 12-Continued

Year 1953

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
TEXAS													
Number		2	2	3	9	4	5	11		3	1	9	49
Days		1	2	1	4	2	4	7		2	1	2	26
Deaths		0	17	1	126	0	0	0		0	0	2	146
Injuries		0	28	15	762	1	0	0		0	0	19	825
Damage		✓240,000	650,000	190,000	✓44,487,000	(1)	(1)	✓54,100		22,000	9,900	✓110,300	45,563,300
UTAH													
Number						1							1
Days						1							1
Deaths						0							0
Injuries						0							0
Damage						(3)							(3)
VERMONT													
Number						1							1
Days						1							1
Deaths						0							0
Injuries						0							0
Damage						800							800
VIRGINIA													
Number				1	3	2							6
Days				1	2	2							5
Deaths				0	0	0							0
Injuries				0	0	0							0
Damage				1,000	18,500	(3)							✓19,500
WASHINGTON (None)													
WEST VIRGINIA (None)													
WISCONSIN													
Number					2	1							3
Days					1	1							2
Deaths					4	0							4
Injuries					✓37	0							✓37
Damage					✓2,000,000	30,000							2,030,000
WYOMING													
Number					2	2	3	2					9
Days					2	2	3	2					9
Deaths					0	0	0	0					0
Injuries					0	0	0	0					0
Damage					51,000	✓11,500	(3)	(3)					✓62,500
ALASKA (None)													
HAWAII (None)													
WEST INDIES (None)													
TOTALS													
Number	14	17	46	55	125	136	50	46	9	7	11	26	542
Days	9	6	*45	*53	*120	59	38	32	6	5	8	*24	*532
Deaths	*6	*3	24	31	60	2	2	2	6	5	8	14	292
Injuries	0	3	**11	**16	**22	**25	**22	**21	**5	**5	**6	**9	**151
Damage	✓21	✓40	✓2	✓879	✓1,040	✓2,642	✓5	✓2	0	0	✓26	✓404	✓5,157
	✓334,600	1,122,500	3,919,900	39,756,500	36,304,100	36,304,300	240,400	✓148,100	7,000	48,000	363,700	✓26,596,800	224,345,900

\* Corrected for boundary-crossing tornadoes.

\*\* Tornado days for country as a whole.

1 Losses occurred; amount not reported.

2 Additional losses occurred.

3 Amount of damage described as small; no monetary estimate.

NUMBER OF TORNADOES, TORNADO DAYS, AND RESULTING LOSSES BY YEARS; 1916-1953

Table 13.

Year	Number reported	Number tornado days	Total loss of life	Most deaths in a single tornado	Total reported property losses	Number of tornadoes causing losses of	
						\$100,000	\$1,000,000
1916	90	36	150	30	\$2,264,500	6	1
1917	121	38	509	101	15,007,700	22	5
1918	81	45	135	36	7,431,150	19	1
1919	65	35	206	59	6,861,500	9	2
1920	87	49	498	87	15,007,500	24	7
1921	106	55	202	61	5,456,300	13	1
1922	108	65	135	16	6,880,000	20	0
1923	102	59	109	23	2,968,725	8	0
1924	130	58	376	85	26,072,350	25	6
1925	119	64	794	689	24,039,900	29	1
1926	111	56	144	23	4,323,950	16	0
1927	164	63	540	92	43,455,650	28	7
1928	203	79	92	14	13,235,600	25	4
1929	197	73	274	40	10,112,400	30	1
1930	192	72	179	41	12,289,100	28	3
1931	94	57	36	6	3,215,900	7	1
1932	152	67	394	37	8,888,525	11	1
1933	260	96	362	34	16,190,640	31	5
1934	147	77	47	6	4,424,950	9	0
1935	182	77	70	11	4,661,430	15	0
1936	159	73	552	216	26,228,550	17	6
1937	148	76	29	5	3,155,875	11	0
1938	220	78	183	32	8,793,457	18	3
1939	155	75	87	27	5,891,930	10	2
1940	128	65	65	18	6,015,320	9	1
1941	118	57	53	25	4,492,650	15	0
1942	170	68	384	65	15,268,950	32	3
1943	155	63	58	5	12,198,400	25	4
1944	173	67	275	100	21,594,150	34	7
1945	126	68	210	69	22,069,800	25	8
1946	109	66	78	15	12,267,015	31	3
1947	171	80	313	169	23,994,680	42	5
1948	190	74	140	33	40,699,650	53	6
1949	262	84	212	58	27,367,380	45	7
1950	209	91	70	18	13,602,340	31	1
1951	300	119	34	6	29,484,275	27	7
1952	270	104	230	57	35,193,900	48	10
1953	532	151	516	116	224,345,900	43	15
Sum	6,306	2,680	8,741	---	---	891	134
Mean	165	71	230	---	---	---	---



# HAILSTORM LOSSES

Table 14

Year 1953

Section	January		February		March		April		May		June		July	
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops
Alabama	(1)		(1)		(2)		(2)	(2)	10,000	20,000	(1)	(1)		
Arizona					3/72,000	3,000	(2)	3/166,200	3/5,000	67,000	(2)	3/25,000	21,500	3/30,000
Arkansas	(2)							750,000					(2)	3,000
California									91,100	100,200	13,000	131,500	65,800	21,300
Colorado														
Connecticut														
Delaware														
Dist. of Columbia									208,500					
Florida							(2)				(2)			
Georgia							(2)	3,500	300	1,200	25,000	102,600		
Idaho														
Illinois					250,000		16,000		100,000	100,000			15,000	150,000
Indiana							1,300		50,000	200,000		85,000		
Iowa					290,000				55,000					4,250,000
Kansas					400,000		500	(2)	76,500	596,000	73,600	3,065,000	25,500	202,500
Kentucky							5,000		305,800	302,800	600	1,800		75,000
Louisiana									780,000	775,000				
Maine														
Maryland							1,000			250,000				
Massachusetts											1,000	2,500	10,000	(2)
Michigan								100	350,000	49,200	3,000	148,200		8,900
Minnesota									20,000	30,000	82,700	384,700	77,000	838,000
Mississippi	(1)				(2)	(2)			(2)	1,000				
Missouri					102,000		140,000		7,000	61,500	12,000	43,000	300,000	841,000
Montana									100,000		257,000	4,206,000		

# HAILSTORM LOSSES

Table 14-Continued

Section	August		September		October		November		December		Crop season April-Sept.		Total		
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property and crops
Alabama	(2)	(2)			(1)						3/10,000	3/20,000	3/10,000	3/20,000	3/30,000
Arizona	4/7,000										4/28,500	4/30,000	4/28,500	4/30,000	4/58,500
Arkansas	(2)	3/100								3,000	3/5,000	3/261,300	3/77,000	3/267,300	3/344,300
California											0	750,000	0	750,000	750,000
Colorado	35,000	76,500				500					204,900	329,500	204,900	330,000	534,900
Connecticut											0	0	0	0	0
Delaware											0	0	0	0	0
Dist. of Columbia											208,500	0	208,500	0	208,500
Florida											0	(2)	0	(2)	(2)
Georgia											3/25,800	107,300	3/25,800	107,300	133,100
Idaho	(2)	(2)									(2)	(2)	(2)	(2)	(2)
Illinois	50,500	850,500		200,000							181,500	1,300,500	431,500	1,300,500	1,732,000
Indiana		51,000									51,300	336,000	51,300	336,000	387,300
Iowa		5,000									55,000	4,255,000	345,000	4,255,000	4,600,000
Kansas	63,200	200,000									239,300	4,163,500	639,300	4,163,500	4,802,800
Kentucky											311,400	379,600	311,400	379,600	691,000
Louisiana							500				780,000	775,000	780,500	775,000	1,555,500
Maine											0	0	0	0	0
Maryland											1,000	250,000	1,000	250,000	251,000
Massachusetts											11,000	2,500	11,000	2,500	13,500
Michigan	3/3,000	128,100		16,300		200					3/356,000	350,800	3/356,000	351,000	707,000
Minnesota	3,000	50,000									4/3182,700	1,302,700	4/3182,700	1,302,700	1,485,400
Mississippi	3,500										3/3,500	1,000	3/3,500	1,000	4,500
Missouri	300,000	60,000									3/459,000	164,500	3/459,000	164,500	725,500
Montana	150,000	1,502,000		8,000							3/4807,000	6,557,000	3/4807,000	6,557,000	7,364,000

See reference notes at end of table.

# HAILSTORM LOSSES

Table 14 -Continued

Year 1953

Section	January		February		March		April		May		June		July	
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops
Nebraska									41,500	57,500	5,000	800,900	147,700	6,484,500
Nevada														
New Hampshire											300	1,000		
New Jersey									2,000		2,000	(2)	1,000	(2)
New Mexico									(2)	(2)		100,000		
New York							(2)					10,000	(2)	(2)
North Carolina							100	13,200	68,500	532,300	177,600	1,888,400	13,000	321,500
North Dakota											29,000	4,000	5,000	
Ohio									25,000	50,000				
Oklahoma					2,405,000		1,700,000	868,500	2,500	9,500	709,400	957,500	10,500	27,900
Oregon														
Pennsylvania									(2)	(2)	(2)	(2)		
Rhode Island														
South Carolina								400,000				125,000		
South Dakota											2,000	115,000	500,000	400,000
Tennessee											7,000	1,000		
Texas					12,500	160,000	215,000	50,000	153,000	1,152,000		500,000		150,000
Utah														
Vermont											500	1,500		
Virginia									(2)	(2)				
Washington														
West Virginia							6/3,100							
Wisconsin									25,000	(1)	(2)	(2)		(2)
Wyoming									500	500	1,000	7,000	500	108,000
Alaska														
Hawaii														
West Indies														
Total	(2)	0	(1)		0 3/3	163,000	2,082,000	2,251,500	2,477,700	4,455,700	1,401,100	12,706,600	1,192,500	13,611,600

# HAILSTORM LOSSES

Table 14-Continued

Section	August		September		October		November		December		Crop season April-Sept		Total		
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property and crops
Nebraska	34,700	450,000									228,900	7,792,900	228,900	7,792,900	8,021,800
Nevada											0	0	0	0	0
New Hampshire											300	1,000	300	1,000	1,300
New Jersey											5,000	(2)	5,000	(2)	5,000
New Mexico	3/76,000	224,000			4/1,000						3/76,000	3/324,000	3/76,000	3/325,000	401,000
New York											(2)	10,000	(2)	10,000	10,000
North Carolina	4,100	86,000		5,000							262,700	2,846,400	262,700	2,846,400	3,109,100
North Dakota	10,000	1,000									44,000	5,000	44,000	5,000	49,000
Ohio											25,000	50,000	25,000	50,000	75,000
Oklahoma	3,000	127,400	20,000								2,445,400	1,990,800	4,850,400	1,990,800	6,841,200
Oregon	500	15,000	4,000	35,000							4,500	50,000	4,500	50,000	54,500
Pennsylvania											(2)	(2)	(2)	(2)	(2)
Rhode Island											0	0	0	0	0
South Carolina											0	525,000	0	525,000	525,000
South Dakota	(2)	(2)									3/502,000	3/215,000	3/502,000	3/215,000	717,000
Tennessee											7,000	1,000	7,000	1,000	8,000
Texas		3/1,900		750,000					(2)		3/368,000	3/2,603,900	3/380,500	3/2,763,900	3,144,400
Utah			(2)	(1)							(2)	(1)	(2)	(1)	(2)
Vermont											500	1,500	500	1,500	2,000
Virginia		205,000									(2)	205,000	(2)	205,000	205,000
Washington											0	0	0	0	0
West Virginia											6/3,100	0	6/3,100	0	6/3,100
Wisconsin		(2)	(2)	50,000							3/25,000	3/50,000	3/25,000	3/50,000	75,000
Wyoming	5,000	40,000									7,000	155,500	7,000	155,500	162,500
Alaska											0	0	0	0	0
Hawaii											0	0	0	0	0
West Indies											0	0	0	0	0
Total	3/748,500	3/54,073,500	3/24,000	3/1,684,300	(1)	4/1,700	500	0	0 3/3,000	3/4,455,700	3/4,455,700	3/4,455,700	3/4,455,700	3/4,455,700	49,788,700

1. Damage reported to be slight.
2. Losses occurred; amount not reported.
3. Additional losses occurred; no accurate estimate obtained.

4. Considerable damage from attendant heavy rains.
5. Considerable damage from attendant heavy winds.
6. Includes crop damage.



# HAILSTORM LOSSES FOR PAST YEARS

Table 15

Year	Property (exclusive of crops)	Crops	Total	Year	Property (exclusive of crops)	Crops	Total
1933.....			\$6,773,800	1944.....	\$9,061,000	\$49,987,900	\$59,048,900
1934.....			11,390,400	1945.....	3,608,200	31,513,400	35,121,600
1935.....			9,471,400	1946.....	9,783,800	30,382,000	40,165,800
1936.....	\$1,953,900	\$9,053,100	11,007,000	1947.....	3,829,300	54,348,900	58,178,200
1937.....	1,797,400	10,991,900	12,789,300	1948.....	12,163,200	56,180,800	68,344,000
1938.....	2,634,700	12,170,200	14,804,900	1949.....	6,335,400	41,646,600	47,983,000
1939.....	358,800	3,153,700	3,512,500	1950.....	21,072,800	28,094,500	49,167,300
1940.....	2,245,900	7,162,400	9,408,300	1951.....	26,416,400	49,015,800	75,432,200
1941.....	1,854,600	11,449,100	13,303,700	1952.....	9,454,400	40,094,300	49,548,700
1942.....	1,513,500	16,407,600	17,921,100	1953.....	11,457,800	38,330,900	49,788,700
1943.....	3,149,200	33,854,200	37,003,400				

# WINDSTORM LOSSES

Table 16

(Windstorms other than tornadoes)

Year 1953

Section	January		February		March		April		May		June		July	
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops
Alabama	5,000		5,000		70,000		33,000		13,000	10,000	73,600		1,000	
Arizona			10,000				2,500				700		48,100	
Arkansas					2/3 447,500		1,928,800	(4)	2/3 27,100	(4)	2/3 201,000	(4)	2/3 124,700	
California									5,000		5,000			
Colorado			41,000	40,000					5,000	5,000	400	20,000	12,000	5,000
Connecticut			800				8 30,000							
Delaware														
Dist. of Columbia											500			
Florida	200,000	(4)			(4)		(5)						(4)	
Georgia	1,500						521,200	(5)	4,200	(5)	170,000	(5)	5,000	1,500
Idaho	(4)								(4)					
Illinois					7,000		405,000	50,000	803,000		925,000		155,000	50,000
Indiana					23,500		56,500		1,100,000		192,200	85,000	235,000	1,000
Iowa					5,000		3,000				914,000		900,000	
Kansas			(5)	(5)	(5)	(5)	(5)	(5)	35,200		9,438,700	47,500	106,800	
Kentucky							3 65,000		3 40,300	3 19,800	3 385,900	3 152,200		1/4,000
Louisiana	2/8,000		3,300		2,000		1/800,000	1/135,000	1/50,150,000	1/45,879,000			1/40,500	
Maine			500				8 50,000		(5)					
Maryland							3,000				100,000			
Massachusetts			2,000				8 75,000		3 500		3,000			
Michigan	4,000						1/51,000		1/107,500	(5)	2/182,000	(5)	2/50,000	(5)
Minnesota					400,000		(5)		1/170,000	(5)	640,500	2/15,000	7,000	
Mississippi	7/100,000	(4)	3,000		3/45,000	3/3,000	1/110,500	1/351,500	1/89,000	1/111,500				
Missouri			6,000		3/66,500		2/26,500		6,000		38,000		6,000	
Montana	22,000	400			1,000				400					40,000
Nebraska							21,800	(4)	218,900		18,000	(4)	437,500	(4)

See reference notes at end of table.

# WINDSTORM LOSSES

Table 16 -Continued

(Windstorms other than tornadoes)

Year 1953

Section	August		September		October		November		December		Crop season April-Sept.		Total		
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property and crops
Alabama	2,000		160,000	3,002,000							282,600	3,012,000	362,600	3,012,000	3,374,600
Arizona	74,500	↓ 100							20,000		↓ 125,800	↓ 100	↓ 155,800	↓ 100	↓ 155,900
Arkansas	↓ 55,900	6,000	(4)	(5)			35,000		36,000		↓ 2,337,500	2	2,856,000	2	2,862,000
California						300,000					10,000	0	10,000	300,000	310,000
Colorado	400	100					25,000		30,000		17,800	30,100	113,800	70,100	183,900
Connecticut			3,000				↓ 1,250,000				33,000	0	↓ 1,283,800	0	↓ 1,283,800
Delaware											0	0	0	0	0
Dist. of Columbia											500	0	↓ 500	0	500
Florida			125,000	40,000	6/ 250,000		(5)	(4)			↓ 125,000	2	40,000	2	615,000
Georgia			16,000	(5)							716,500	1,500	718,000	1,500	719,500
Idaho	(5)	(5)					(4)				(5)	(5)	(5)	(5)	(5)
Illinois	500		1,700,000	100,000							3,988,500	200,000	3,995,500	200,000	4,195,500
Indiana	77,500		23,000						4,000		1,684,200	86,000	1,711,700	86,000	1,797,700
Iowa	3,000	15,000									1,820,000	15,000	1,825,000	15,000	1,840,000
Kansas	12,000				(5)						9,592,700	47,500	9,592,700	47,500	9,640,200
Kentucky	↓ 4,500	2/ 500									↓ 495,700	↓ 2/ 176,500	↓ 2/ 176,500	↓ 2/ 176,500	↓ 2/ 176,500
Louisiana		1,000					35,000				50,990,500	46,015,000	51,038,800	46,015,000	97,053,800
Maine			1,020,000		(5)						1,070,000	0	1,070,500	0	1,070,500
Maryland											103,000	0	103,000	0	103,000
Massachusetts			50,000		(5)		250,000		2,500		↓ 128,500	0	383,000	0	383,000
Michigan	↓ 106,500	(5)	2,000								499,000	(5)	503,000	(5)	503,000
Minnesota											817,500	15,000	1,217,500	15,000	1,232,500
Mississippi	↓ 2,500	↓ 1,000					5,000		1,500	1,000	↓ 202,000	464,000	↓ 356,500	468,000	824,500
Missouri	50,000		12,000								138,500	0	211,000	0	211,000
Montana	↓ 159,000	2/ 200,000			20,000				6/ 15,000		↓ 159,400	2/ 240,000	↓ 217,400	2/ 240,400	457,800
Nebraska	7,000										703,200	(4)	703,200	(4)	703,200

# WINDSTORM LOSSES

Table 16 -Continued

(Windstorms other than tornadoes)

Section	January		February		March		April		May		June		July	
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops
Nevada														
New Hampshire			500				8/ 50,000		(5)		800			
New Jersey	25,000		20,000		30,000		25,000		15,000		10,000	(4)	10,000	(4)
New Mexico									5,500					
New York			2/ 18,000				(5)		1,000,000		97,400	10,000	6/ 2,008,000	
North Carolina			19,900						21,000	40,000	155,000	260,000		50,000
North Dakota					(4)						20,000			
Ohio					500						19,000	1,000	13,500	2,500
Oklahoma					213,200		91,000		11,000	2,000	313,900	173,000	87,500	
Oregon	1,000,000	4,000											2/ 50,000	(5)
Pennsylvania	(5)				(5)				(5)		(5)			
Rhode Island			800				8/ 35,000							
South Carolina							20,000		4,000		18,000	22,000		
South Dakota	8/ 8,000								40,000		↓ 258,000	↓ 42,000	(4)	(4)
Tennessee	1,400				(5)	(5)			60,000	(5)	4,500		2,000	
Texas	211,200		(5)		6/ 65,000		374,000	50,000	29,900	3,000	183,300	5,000	25,000	
Utah			25,000											
Vermont			500				8/ 10,000				1,500			
Virginia	50,000						6,000		100,000		2,500	(4)		
Washington	95,000		65,000											
West Virginia							20,000		↓ 2,600		6/ 3,000	(5)	(5)	(5)
Wisconsin					200,000				650,000		↓ 1,577,000	(4)	↓ 452,000	(4)
Wyoming					100			100,000	13,000	100			21,000	2,000
Alaska	9,100													
Hawaii	10,000									(4)				
West Indies														
Total	3/ 1,750,200	2/ \$4,400	2/ \$221,300	2/ \$40,000	2/ \$1,576,300	2/ \$3,000	2/ \$4,812,800	2/ \$686,500	2/ \$54,727,200	2/ \$46,070,400	2/ \$15,949,900	2/ \$835,200	2/ \$4,797,600	2/ \$156,000

See reference notes at end of table.



# WINDSTORM LOSSES

YEAR 1953

Table 16 -Continued

(Windstorms other than tornadoes)

Section	August		September		October		November		December		Crop season April-Sept.		Total		
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property and crops
Nevada											0	0	0	0	0
New Hampshire											2/8 50,800	0	2/8 51,300	0	2/8 51,300
New Jersey	15,000	(4)	10,000		20,000		3,000,000		20,000		85,000	(4)	3,200,000	(4)	3,200,000
New Mexico	4,000										9,500	0	9,500	0	9,500
New York	185,000		10,000				1,675,000		10,000		3,300,400	3,000	5,003,400	10,000	5,013,400
North Carolina	152,600	1,027,500	10,000								338,600	1,377,500	358,500	1,377,500	1,736,000
North Dakota											20,000	0	20,000	0	20,000
Ohio			29,000	5,000					100,000		61,500	8,500	162,000	8,500	170,500
Oklahoma	24,600		500		1,500				10,000		528,500	175,000	753,200	175,000	928,200
Oregon			6,000	15,000					90,000	1,500	6,000	15,000	1,096,000	20,500	1,116,500
Pennsylvania	35,000	(5)	(5)						(5)		85,000	(5)	85,000	(5)	85,000
Rhode Island			10,000				500,000				45,000	0	545,800	0	545,800
South Carolina											42,000	22,000	42,000	22,000	64,000
South Dakota	305,000	51,500									603,000	93,500	611,000	93,500	704,500
Tennessee									(5)		66,500	(5)	67,900	(5)	67,900
Texas	1,000				2,048,000				5,500		613,200	58,000	2,942,900	58,000	3,000,900
Utah					100,000						0	0	125,000	0	125,000
Vermont											11,500	0	12,000	0	12,000
Virginia			(4)	(4)							106,000	2,500	156,000	2,500	158,500
Washington	2,500	5,500	75,000				50,000		70,000		77,500	5,500	357,500	5,500	363,000
West Virginia											25,600	(5)	25,600	(5)	25,600
Wisconsin	480,000	(4)	85,000						17,700		3,244,000	(4)	3,461,700	(4)	3,461,700
Wyoming			200	500							34,200	102,600	34,300	102,600	136,900
Alaska							750,000				0	0	759,100	0	759,100
Hawaii											0	(4)	10,000	(4)	10,000
West Indies											0	0	0	0	0
Total	\$1,700,000	\$1,308,200	\$3,346,700	\$3,162,500	\$2,438,500	\$300,000	\$7,575,000	(4)	\$432,200	\$2,500	\$85,395,200	\$52,218,800	\$99,289,700	\$52,568,700	\$151,958,400

1. Damage from attendant heavy rains.
2. Additional losses occurred.
3. Damage from attendant hail.
4. Damage reported to be slight.

5. Losses occurred; amount not reported.
6. Includes crop damage.
7. Includes lightning damage.
8. Damage from attendant heavy snow.

## WINDSTORM LOSSES PAST YEARS

Table 17

(Windstorms other than tornadoes)

Year	Total loss of life	Total property loss	Year	Total loss of life	Total property loss
1916.....	65	\$11,712,100	1937.....	43	\$6,292,900
1917.....	25	1,400,600	1938.....	630	315,435,400
1918.....	79	7,602,200	1939.....	60	3,988,100
1919.....	344	28,170,800	1940.....	251	25,588,900
1920.....	42	4,735,400	1941.....	43	15,523,300
1921.....	65	13,174,700	1942.....	58	32,691,600
1922.....	133	5,055,800	1943.....	61	25,056,500
1923.....	68	5,261,800	1944.....	448	207,745,900
1924.....	78	13,545,800	1945.....	85	36,498,700
1925.....	88	11,612,400	1946.....	70	29,515,200
1926.....	357	93,610,300	1947.....	117	135,377,500
1927.....	64	6,783,200	1948.....	52	59,169,900
1928.....	1,947	88,836,000	1949.....	102	69,476,600
1929.....	46	20,334,600	1950.....	210	134,798,800
1930.....	49	5,705,500	1951.....	289	86,296,600
1931.....	17	7,773,000	1952.....	137	78,484,000
1932.....	306	42,657,400	1953.....	118	151,958,400
1933.....	156	65,604,100			
1934.....	109	19,497,200			
1935.....	461	17,191,000			
1936.....	121	17,256,300			
			Total.....	7,404	
			Mean.....	195	

# NORTH ATLANTIC HURRICANES AND TROPICAL DISTURBANCES

## YEAR 1953

The number of tropical disturbances that occurred during the 1953 season is slightly below the seasonal average for the period 1915 to 1953, inclusive. There were eight storms and all but two were hurricanes. The season began with a May storm (ALICE), which barely missed reaching hurricane intensity, and ended October 10 with the only other storm in the season that was not of hurricane force. The May storm is the 9th tropical storm known to have occurred in that month. One occurred in 1887 and the next in 1932. The May storm of 1951 is the only one that has been classified as a hurricane.

The August storm (BARBARA), all four of the September storms (CAROL, DOLLY, EDNA, and FLORENCE), and the first October storm (GAIL) were of hurricane intensity. Four storms reached the United States coast line and two of these (BARBARA and FLORENCE) were hurricanes. Two of these four storms (ALICE and FLORENCE) entered northwest Florida near Panama City. HAZEL crossed the Florida Peninsula from west to east, and BARBARA crossed the North Carolina coast line between Morehead City and Ocracoke.

All four of the storms that reached the United States coast (ALICE, BARBARA, FLORENCE, and HAZEL) had their origin in the western Atlantic and Caribbean. Hurricane CAROL originated some distance to the east of the Lesser Antilles; DOLLY and EDNA originated near this island chain; and GAIL originated near 35° W. longitude. There was only one storm (GAIL) that was not over or near some land area at one time during its course. Hurricane CAROL passed within 150 miles of Eastport, Me., and Nantucket, Mass., and across New Brunswick, Canada. DOLLY passed nearly over the Virgin Islands and Bermuda, and EDNA passed close to Bermuda. For the second consecutive season no storms originated in the Gulf.

Considering the number of the storms that entered the United States or affected other land areas, the amount of damage was comparatively small. Damage in the United States resulting from three of the storms that crossed its coast lines, and from hurricane CAROL, which passed 150 miles off the New England coast, amounted to about \$6,162,500. There was little or no damage from tropical storm ALICE. It caused damage from floods in Cuba, however, and several deaths from drowning. Two deaths occurred in the United States from hurricane BARBARA, and one life was lost at sea from hurricane CAROL. No damage estimates for areas outside of the United States are available.

The following are individual reviews of all North Atlantic hurricanes and tropical disturbances that occurred during the 1953 season. All times mentioned are in Eastern Standard ( - 5 Zone Time). A synopsis of the important features of these storms is given in table 18a; their tracks are shown by chart at the end of this bulletin.

ALICE--May 25-June 6.--The first tropical storm of the 1953 hurricane season was noted as a wave on the intertropical convergence zone on May 25 in the Caribbean Sea east of the coast of Nicaragua. The wave developed a weak closed circulation on the 26th, which looped inland over eastern Honduras and northeastern Nicaragua. The storm emerged southeast of Cape Gracias on the 28th and moved northward. By the 30th, when it was near the Isle of Pines, a fairly well defined center was again observed, with strongest winds about 40 knots (46 m.p.h.). The storm center crossed extreme western Cuba the night of the 31st, and on June 1 aircraft

reconnaissance observers reported maximum winds of 55 knots (63 m.p.h.) and a better defined center near latitude 24° N., longitude 85° W, but during the night of the 1st it looped southward and lost some force. During June 2 and 3 the center drifted slowly eastward near the Cuban coast, with maximum winds of about 40 knots (46 m.p.h.), to a position a few miles northwest of Havana by the night of the 3d. Here a north-northwesterly course was resumed on the 4th, and on the 5th the strongest winds observed during the life of the storm were reported by aircraft reconnaissance observers in the northeastern Gulf. The crew of a Coast Guard patrol plane and Navy reconnaissance observers reported short period squalls of 60 to 65 knots (69 to 75 m.p.h.) to the northeast of the center near latitude 29° N., longitude 83° to 85° W., at which time the lowest central pressure for the storm, 29.44 inches, was reported.

During the night of the 5th the storm again lost force and when it moved inland a short distance west of Panama City, Florida, at about noon of the 6th, the strongest winds were around 35 to 40 knots (40 to 46 m.p.h.). Squally weather continued in the general area of the last point of observation - southeastern Alabama - for about three days before the storm lost its identity.

Heavy rains in connection with the storm broke a long dry spell in Cuba, and in sections of western Cuba, especially in Mantanzas, Havana, and Pinar del Rio Provinces, floods caused considerable damage. The loss of several lives by drowning was reported by the press. In Florida the rains were beneficial and little or no damage was caused by the wind. The strongest winds were only around 40 to 45 m.p.h. from the Miami area southward through the Keys, and at places on the west coast.

BARBARA--August 11-15.--An easterly wave that had been under observation for several days developed into a tropical storm during the night of August 11 a short distance northeast of the Bahama Islands. On the morning of the 12th the center, still in a formative stage, was located by airplane reconnaissance near latitude 29° N., longitude 76° W. Highest winds were then near 65 knots (75 m.p.h.) on the northeast side, but the southwest side was open. The storm slowly intensified as it moved northward during the 12th and 13th and winds were reported by aircraft to be slightly above 100 m.p.h. when it was about 120 miles south of Cape Lookout, N. C. The center passed inland between Morehead City and Ocracoke, N. C., between 9:00 and 10:30 p.m. of the 13th, and began a slow curve to the northeast. It re-entered the Atlantic near the North Carolina-Virginia border between 5:00 and 6:00 a.m. of August 14, after sweeping the entire Capes section of North Carolina.

The lowest pressure reported on land was 29.19 inches at Coinjock, N. C., near where the storm re-entered the Atlantic, but Morehead City and Belhaven, N. C., both reported 29.20 inches. Actual central pressure was probably about 29.15 inches, since aircraft reconnaissance observers had reported this reading and 90 to 100-m.p.h. winds a short time before the storm went inland. The strongest winds reported at land stations were gusts of 90 m.p.h. at Hatteras and Nags Head. Gusts of 78 m.p.h. were reported from Cherry Point before a power failure rendered some instruments useless. Radar fixed the center of the storm 23



# NORTH ATLANTIC HURRICANES AND TROPICAL DISTURBANCES—Continued

YEAR 1953

miles east of Cherry Point at 9:30 p.m., August 13; an amateur radio operator at Ocracoke reported being in the eye one hour later; and near 3:00 a.m., August 14, the eye passed about 10 miles west of Nags Head. The storm was centered off the coast about 35 miles southeast of Ocean City, Md., at 11:00 a.m. of the 14th. Winds were then 75 m.p.h. near the center of the storm and 60 m.p.h. at coast stations. Atlantic City, N. J., experienced 61-m.p.h. winds and the strongest winds in New England were about 60 m.p.h. The storm passed a short distance southwest of Nantucket during the night of August 14-15. When it passed near Halifax, Nova Scotia, at about 3:00 p.m. of the 15th, highest winds were estimated to be 55 to 60 m.p.h. near the center. It was centered over the southwest tip of Newfoundland at 11:30 p.m. of the 15th and passed into the Gulf of St. Lawrence with winds estimated to be above 50 m.p.h. near the center.

Meteorological data associated with this storm are given for selected stations in table 18.

Morehead City suffered \$5,000 damage, New Bern \$75,000, Kitty Hawk \$25,000, and Elizabeth City, \$30,000. There was some damage to hangars at Cherry Point. Crop damage in the vicinity of Washington was 10 percent. The entire crop and property damage in the North Carolina-Virginia Capes area was estimated at over \$1,100,000, of which over \$1,000,000 was to crops. At Virginia Beach windows and roofs were damaged and a small section of the beach was washed away. There was only minor property damage along the Maryland, Delaware, New Jersey, and New England coasts. Farmers in Delaware reported considerable damage to lima bean and corn crops. The Norwegian tanker Marina went out of control directly in the hurricane's path 22 miles southeast of Cape Lookout, N. C., but weathered the blow.

Two deaths resulted from this storm. A man was blown off a fishing pier at Wrightsville Beach, Wilmington, N. C., and carried out to sea. A Norfolk County, Va., policeman was electrocuted trying to lift a broken "live" wire from an automobile. Two marines were injured at the Marine Corps Cherry Point Base.

CAROL--September 1-7.--The wave from which this hurricane formed was traced from the coast of Africa, where it was noted on August 28. It passed the Cape Verde Islands on the 29th as a mild wave moving westward, and showed signs of beginning a development on August 31, when it was near latitude 14° N., longitude 40° W. At 12:45 p.m., E.S.T., September 1, the S.S. Umatilla reported north-northeast winds of force 11 to 12, very high seas, and rapidly falling pressure at latitude 14.3° N., longitude 48.5° W., when very near the storm's center, giving the first indication that a hurricane had developed. It became a very severe hurricane during the next few days as it moved on a west-northwesterly course some distance north of the Leeward Islands and Puerto Rico. On the 3d and 4th aircraft reconnaissance observers reported winds estimated at 130 knots or higher (over 150 m.p.h.) and a central pressure of 27.45 inches, which represented maximum development. By the 6th, when it passed midway between Cape Hatteras and Bermuda, there were signs of weakening and thereafter it gradually lost force. However, winds were 69 knots (80 m.p.h.) when the center was 150 miles northeast of Eastport, Me., and still near hurricane strength when the center passed over

New Brunswick and near Nova Scotia on the 7th. As the storm moved over the Gulf of St. Lawrence on the night of the 7th, it was rapidly losing intensity and winds were estimated at 60 m.p.h. over a small area near the center with gales extending outward 150 miles.

The center of the storm also passed within 150 miles of Nantucket on the 7th, causing winds there up to 47 knots (54 m.p.h. - recorded). The Maine coast was gale lashed, and heavy seas pounded the coast line. A fishing craft broke up on the rocks at Dolliver's Neck off Gloucester, with loss of vessel and cargo, and a power yacht sank 150 miles east of Boston. Maine fishermen lost an estimated \$1,000,000 worth of gear, mostly lobster pots, in the gale and pounding seas. Heavy rains swept Cape Cod and coastal Maine as the storm swept by.

The Panamanian freighter Eugenia became grounded when it was driven onto South Peak Hill Bar near Cape Cod by the backlash of the hurricane on the 7th. The liner Queen of Bermuda, on a cruise from New York to Bermuda, encountered 50-knot winds and poor visibility at 10:00 a.m. on the 6th, when the storm passed 40 miles to the southwest of its position at latitude 33° 35' N., longitude 68° 50' W. In the same position at noon, the ship's master reported 60-knot (69 m.p.h.) winds, bad visibility, confused swells, and high seas. A crew member lost his life when a hurricane-tossed wave threw him against an insulator. More than a score of passengers were injured when they were hurled against the ship's sides by mountainous seas.

High winds damaged communications and power lines in New Brunswick and Nova Scotia. Winds as high as 60 m.p.h. in gusts were reported at Dartmouth, Nova Scotia.

DOLLY--September 8-13.--Evidence of this hurricane was first noted on September 8 when an easterly wave moved into the eastern Caribbean Sea, causing very heavy rainfall in the Virgin Islands and Puerto Rico. On the 9th aircraft reconnaissance observers found a developing center in the wave near latitude 21° N., longitude 69° W. The storm developed rather slowly and curved to northward during the 9th. It reached maximum development on the 10th when winds were estimated by aircraft reconnaissance observers to be about 100 knots (115 m.p.h.) near latitude 26° N., longitude 71° W., during recurvature. Thereafter it moved north-eastward with waning force and passed nearly over Bermuda on the night of the 11th. Winds were not of hurricane force at Bermuda, although they were estimated at 78 to 87 knots (90 to 100 m.p.h.) near the center when the storm was a short distance to the southwest. There was little or no damage at Bermuda. After passing Bermuda the storm continued on a northeastward course over the Atlantic, during the 12th and 13th at a rapid rate of speed. Winds were estimated at near hurricane force in squalls during the 12th.

EDNA--September 14-19.--This storm began as a squally wave over and north of the Leeward Islands on September 14, but a center could not be located until the morning of the 15th. By that time it had moved northwestward to about latitude 20° N., longitude 66° W. It increased rapidly to a hurricane of about 109 knots (125 m.p.h.), which was the maximum development, and began a broad curve to the north and northeast. The storm followed a path closely parallel to the course taken by DOLLY a few days earlier. It passed close to and north of Bermuda on the evening of the 17th and winds

# NORTH ATLANTIC HURRICANES AND TROPICAL DISTURBANCES—Continued

YEAR 1953

reached 120 m.p.h. in gusts on the island. Thereafter it moved with accelerating speed northeastward over the ocean and was beyond range of reconnaissance aircraft by the 19th. On the morning of the 18th winds were estimated to be as high as 82 knots (95 m.p.h.) in squalls near the center with gales extending 250 miles from center. By late afternoon winds had decreased to 61 knots (70 m.p.h.) near the center but there was an indication that the area of gales was increasing.

The hurricane apparently caused no damage on any of the islands of the eastern Caribbean, having formed well to the north of the islands, and caused only gentle to moderate westerly and southerly winds as it passed to the northward during its formative stages. Bermuda suffered considerable damage in this hurricane but no estimate of monetary value was received. Many homes throughout the colony lost their roofs and were flooded in torrential rains accompanying the hurricane. Electric power and telephone lines and poles were down and many roads and streets were blocked by fallen trees and other debris. Part of the lobby and other ground floor ceilings of the Elbow Beach Surf Club collapsed when the upper ceilings dropped in on them, and almost all of the rooms were flooded. Considerable havoc was caused to small boats in Hamilton Harbor, and at Albuoy's Point the new sail boat "Encore" was smashed to wreckage against the sea wall.

There were three injuries in Bermuda but no deaths.

**FLORENCE**--September 23-26.--This fourth September hurricane developed from an easterly wave which moved through the Caribbean Sea. The first signs of the development were observed on the 23d about 100 miles southeast of Jamaica, but a definite center did not form until the morning of the 24th when the storm was approaching the Yucatan Channel. It reached hurricane strength while passing through the Yucatan Channel into the Gulf of Mexico during the afternoon of the 24th, and reached its greatest force on the 25th as it curved northward in the Gulf. Strongest winds, as estimated by aircraft reconnaissance observers, were 110 to 120 knots (127 to 138 m.p.h.) during that day, but it is believed that these estimates were higher than actual surface speeds. When the center reached the northwest Florida coast between Valparaiso and Panama City near mid-day of the 26th, the highest wind reported was around 90 m.p.h., but rainfall was heavy. The Pensacola Weather Bureau Office reported winds of 42 m.p.h. at 8:48 a.m. and peak gusts up to 75 m.p.h. at 8:41 a.m. on the 26th. Lowest barometer reading at Pensacola was 29.44 inches at 9:10 a.m. The storm passed inland over a sparsely settled area of Florida and this probably accounts for the rather small amount of damage.

Damage over extreme northwest Florida was estimated at \$100,000 to \$200,000. At Pensacola alone it amounted to \$50,000. In the vicinity of Crestview, damage to crops was \$35,000. In Franklin and Okaloosa Counties of northwest Florida the Red Cross estimates showed that 273 homes were destroyed, 145 other buildings damaged, and 3 destroyed. In southeastern Alabama damage was estimated at \$3,162,500, of which \$3,002,000 was to crops from wind and rain. A fishing trawler, the Miss Tampa, was reported missing in the storm's wake and a Costa Rican motor vessel radioed that it had lost its rudder and was in serious distress off the Texas coast.

When the storm passed a short distance south of Columbus, Ga., about 11:00 p.m. of the 26th, highest winds were 40 to 50 m.p.h. in squalls. At 5:00 a.m. of the 27th the center was near Albany, Ga., and wind speeds were occasionally up to 30 or 40 m.p.h. in rain squalls over northern Florida, Alabama, Georgia, and South Carolina.

A tabular listing of meteorological data associated with this storm, is contained in table 18.

**GAIL**--October 2-5.--The first indication of the possible formation of this hurricane was the intensification of an easterly wave with the center of activity near latitude 14° N., longitude 37° W. on the morning of October 2. During the early morning of the following day the S.S. Thorbjorg passed through the center of the storm about 400 miles further west and reported westerly winds estimated at 65 to 69 knots (75 to 80 m.p.h.) and rough seas. The ship's lowest barometer reading was 29.12 inches at the time it passed through the storm's center. No further definite fixes were obtained but apparently the storm moved westward, then southwestward, and had dissipated by October 5.

**HAZEL**--October 8-10.--A tropical disturbance formed in the Yucatan Channel on October 8. It moved northeastward and by 5:00 p.m. was centered near latitude 23.8° N., longitude 85.4° W., or 240 miles west-southwest of Key West, Florida. Winds were then 39 knots (45 m.p.h.). On the 9th winds were estimated to be 52 to 65 knots (60 to 75 m.p.h.) over a small area northeast of the center. The storm moved into Florida through Charlotte Harbor, between Ft. Myers and Punta Gorda, about 11:30 a.m. of the 9th, with winds slightly below hurricane force. Winds of 60 to 70 m.p.h. attended its rapid northeastward transit of Florida. Lowest pressure recorded was 29.15 inches at the U. S. Engineers Office at Okeechobee City, and this station also reported the strongest winds, 80 m.p.h. in gusts. It is believed, however, that these winds resulted from a tornado-like squall rather than from sustained conditions in the tropical storm. Ft. Myers reported 62 m.p.h. winds in gusts, Captivia 70, and Patrick Air Base at Cocoa 64. A small tornado occurred at St. James City on Pine Island west of Ft. Myers. It was on the storm's leading edge as it crossed Florida.

On Pine Island several houses were damaged or destroyed by the tornado and at Okeechobee City a hangar was damaged and an airplane wrecked. Other damage was mostly of a minor nature. The wind damage was estimated at about \$250,000, \$96,000 of which occurred in the area of the west coast from the Ft. Myers area northward to Sarasota.

The storm passed into the Atlantic near Vero Beach and after leaving Florida it moved rapidly northeastward over the Atlantic and became extra-tropical on the 10th when it was about midway between Cape Hatteras and Bermuda. Winds were then between 60 and 65 m.p.h. in squalls.

The rainfall associated with HAZEL added to the flood conditions existing from previous rains in several of the river valleys of Florida, as well as some of the Everglades area. The overall flood damage is estimated at 9 to 10 million dollars, but it is not possible to separate the flood damage caused by HAZEL from the damage done by other rains. The upper St. Johns River reached the highest stage ever known, exceeding by 1½ feet the previous record and covering six miles of the highway between Melbourne and Kissimmee.

A tabular listing of meteorological data associated with this storm is contained in table 18.



# HURRICANE DATA

Table 18

for storm of

August 11-15

Station	Date	Pressure <sup>1</sup>		Wind <sup>2</sup>						Rainfall	Miscellaneous
		Low	Time	5-min. max.	Time	1-min. max.	Time	Gusts	Hours of gales		
Wilmington	13	29.68	6:30 p.m.	----	-----	30 N	-----	38	-----	1.29	Tower reported gusts to 80 m.p.h.
Morehead City	13	29.20	5:30 p.m.	----	-----	60 NE	-----	70	-----	5.92	
Cherry Point	13	29.26	7:24 p.m.	----	-----	45 N	7:24 p.m.	*78	-----	5.58	*Instrument blown away, probably higher. Radar fixed center 23 miles east.
New Bern	13	29.42	10:10 p.m.	----	-----	35 NW	-----	48	-----	5.11	Tides 5.96 ft. high.
Oriental	13	29.21	10:00 p.m.	----	-----	50 NE	-----	-----	-----	3.28	Wind NE before storm; NW after.
Hatteras	13	29.25	11:25 p.m.	----	-----	77 SE	-----	90 ESE	-----	3.66	
Washington	13	29.30	12 midt.	----	-----	50-60 NW	-----	-----	-----	-----	
Belhaven	13	29.20	11:30 p.m.	----	-----	-----	-----	-----	-----	-----	Wind NE before storm; WNW after.
New Holland	13	29.25	11:00 p.m.	----	-----	-----	-----	50-60	-----	5.70	Tides 5.40 ft.
Nags Head	14	29.28	3:30 a.m.	----	-----	-----	-----	90	-----	9.67	Center about 10 miles west. Wind dropped to about 32 m.p.h. at 3 a.m. from SE.
Kitty Hawk	14	29.21	3:55 a.m.	----	-----	-----	-----	ECSE	-----	-----	
Elizabeth City	14	29.24	4:30 a.m.	----	-----	55 NE	-----	65	-----	6.09	
Coinjock	14	29.19	4:00 a.m.	----	-----	-----	-----	-----	-----	-----	
Atlantic City	14	29.60	-----	----	-----	61 N	-----	-----	-----	7.33	
Norfolk	13	-----	-----	----	-----	39	-----	-----	-----	3.46	
	14	29.39	-----	----	-----	63	-----	76	-----	2.82	
New York	14	-----	-----	----	-----	NE&W	-----	-----	-----	1.36	
	-15	-----	-----	----	-----	32-33	-----	-----	-----	-----	
Nantucket	14	-----	-----	----	-----	36 SE	-----	-----	-----	2.00	
	15	29.33	-----	----	-----	47 NW	-----	-----	-----	.40	

for storm of

September 23-26

Station	Date	Pressure <sup>1</sup>		Wind <sup>2</sup>						Rainfall	Miscellaneous
		Low	Time	5-min. max.	Time	1-min. max.	Time	Gusts	Hours of gales		
Pensacola	26	29.44	9:10 a.m.	35 N	8:45 a.m.	42 N	8:48 a.m.	75 NW at 8:41 a.m.	-----	9.08	Tide 3 ft. at 2:15 a.m. c.s.t.
De Funiak Springs	26	29.26	11:00 a.m.	----	-----	-----	-----	59	-----	9.34	30 to 40-minute lull.
Niceville	26	-----	-----	----	-----	-----	-----	-----	-----	11.85	
Panama City	26	29.35	8:00 a.m.	----	-----	87	-----	-----	-----	10.70	Tide 1.5 ft.
Compass Lake	26	-----	-----	----	-----	45	-----	55	-----	6.88	
Apalachicola	26	29.48	9:00 a.m.	----	-----	52	-----	-----	-----	8.95	Tides 5.0 ft.
Quincy	26	-----	-----	----	-----	-----	-----	-----	-----	3.63	
Carrabelle	26	-----	-----	----	-----	-----	-----	-----	-----	5.49	Tides 4 to 5 ft.
Panacea	26	-----	-----	----	-----	-----	-----	-----	-----	-----	Tide 6 or 7 ft. All coastal area under water.
Tallahassee	26	29.49	3:00 p.m.	----	-----	-----	-----	-----	-----	3.00	
St. Marks	26	-----	-----	----	-----	-----	-----	-----	-----	4.25	
Monticello	26	-----	-----	----	-----	30-35	-----	-----	-----	5.43	
Mayo	26	29.50	2:00 p.m.	----	-----	32-38	-----	-----	-----	5.04	
Cedar Key	26	29.60	10:00 a.m.	----	-----	50	-----	-----	-----	2.60	
Lake City	26	29.69	2:36 p.m.	----	-----	18	-----	-----	-----	4.00	
Crestview	26	29.33	11:00 a.m.	----	-----	-----	-----	-----	-----	-----	

for storm of

October 8-10

Station	Date	Pressure <sup>1</sup>		Wind <sup>2</sup>						Rainfall	Miscellaneous
		Low	Time	5-min. max.	Time	1-min. max.	Time	Gusts	Hours of gales		
Alligator	9	29.68	2:00 p.m.	----	-----	47 S	10:09 a.m.	-----	-----	-----	
Arcadia	9	29.46	1:30 p.m.	----	-----	37 N	1:15 p.m.	-----	-----	8.23	Lull 1:45-2:08 p.m. Wind N before and W after lull. Heavy thunder and lightning before lull. Wind 16 m.p.h. after lull.
Belle Glade-USE	9	29.52	2:15 p.m.	----	-----	36 SSE	12:50 p.m.	46	-----	.91	
Canal Point	9	-----	-----	----	-----	50-55 SW	-----	-----	-----	1.02	
Captivia	9	29.25	10:50 a.m.	----	-----	50 S	10:50 a.m.	70 S	-----	5.13	Sharp lightning and heavy squall. Wind shifted from NE to E. Tide about 4 1/2 ft. at 1:30 p.m.
Carrsfort	9	29.54	12:00 noon	----	-----	57 S	12:47 p.m.	-----	-----	-----	
Clewiston	9	29.49	2:00 p.m.	----	-----	26 SSE	2:00 p.m.	52 S	-----	.87	
Daytona Beach	9	29.69	6:30 p.m.	----	-----	40 NNE	6:29 p.m.	55	-----	-----	Tides 3 to 3 1/2 ft. above normal.
Egmont Key	9	29.68	1:00 p.m.	----	-----	58 N	10:25 a.m.	-----	-----	-----	
Ft. Meade	9	29.49	2:00 p.m.	----	-----	-----	-----	-----	-----	-----	
Ft. Myers	9	29.37	11:18 a.m.	----	-----	45 SW	11:18 a.m.	62 SW	-----	5.02	Lull about 11:00 a.m. Tide 3 1/2 to 4 ft. above normal. Beach inundated 1 to 2 ft. Tornado occurred in connection with storm.

# HURRICANE DATA

Table 18—Continued

for storm of

October 8-10

Station	Date	Pressure		Wind						Rainfall	Miscellaneous
		Low	Time	5-min. max.	Time	1-min. max.	Time	Gusts	Hours of gales		
Ft. Pierce	9	29.26	4:15 p.m.	----	-----	47	4:10 p.m.	55	-----	1.10	Lightning at 10:00 a.m. Sudden shift of wind at 4:15 p.m. SE to S to SW, then slow to W. Center probably 4 to 8 miles north.
Hillsboro Light	9	29.55	4:00 p.m.	----	-----	56 S	9:05 a.m.	-----	-----	-----	
Jupiter Inlet	9	29.51	3:00 p.m.	----	-----	42 E	4:08 p.m.	-----	-----	-----	
Lake Placid (coop.)	9	29.38	2:00 p.m.	----	-----	57 NW	2:15 p.m.	-----	-----	4.43	
Lake Placid (Ham)	9	29.40	2:00 p.m.	----	-----	45-55 NW	2:30 p.m.	-----	-----	3.50	
Melbourne, WBO	9	29.47	5:20 p.m.	----	-----	42 NNE	6:10 p.m.	47	-----	4.21	Water 1 1/2 ft. above any high point ever recorded on west side levee of Melbourne-Tillman drainage district on St. Johns River.
Moorehaven	9	29.37	2:00 p.m.	----	-----	-----	-----	48 SSW	-----	4.35	
Okeechobee, USE	9	29.15	3:00 p.m.	----	-----	60 SSW	3:00 p.m.	80 SSW	-----	.46	
Orlando	9	29.65	4:25 p.m.	----	-----	38 NNE	3:27 p.m.	49	-----	.69	
Patrick A.F. Base	9	29.48	4:30 p.m.	----	-----	49 N	5:45 p.m.	64	-----	-----	
Ponce de Leon	9	29.68	5:00 p.m.	----	-----	40 E	3:30 p.m.	-----	-----	-----	
Sarasota	9	29.63	11:00 a.m.	----	-----	45 N	11:30 a.m.	50 N	-----	2.14	
St. Augustine	9	29.72	5:30 p.m.	----	-----	31 NE	5:30 p.m.	33 NE	-----	-----	
St. James, Pine Is.	-	-----	-----	----	-----	-----	-----	-----	-----	-----	Small tornado or waterspout damaged houses.
Tampa	9	29.64	1:40 p.m.	----	-----	35 NNE	2:30 p.m.	52 NNE	-----	-----	
Venus	9	-----	-----	----	-----	40-45 estimated	-----	-----	-----	4.40	
West Palm Beach	9	29.54	3:15 p.m.	----	-----	40 SSW	9:39 a.m.	55	-----	1.06	Rain squalls during day gave higher wind speed than occurred when storm made nearest approach.

<sup>1</sup> Pressure in inches and reduced to sea level.

<sup>2</sup> Wind speed is given in miles per hour.

WBO indicates Weather Bureau Office; USE, U.S. Engineers Office.



# HURRICANES AND TROPICAL DISTURBANCES

Table 18a

(Names of storms in table correspond to names of tracks on chart at end of publication)

YEAR 1953

Storm name	Date	Area where first reported	Coast lines crossed	Highest wind speed reported	Lowest pressure reported	Place of dissipation reported	Intensity	Remarks
ALICE	May 25-June 6	East of the coast of Nicaragua	Florida	69-75 m.p.h., estimated	29.44 in.	Western Florida	Near hurricane	Floods in western Cuba caused considerable damage and the loss of several lives by drowning.
BARBARA	Aug. 11-15	Northeast of the Bahama Islands	North Carolina	Slightly above 100 m.p.h., estimated	29.19 in.	Over Gulf of St. Lawrence	Hurricane	Damage in North Carolina-Virginia Capes area amounted to around \$1,100,000. One death occurred in North Carolina and one in Virginia.
CAROL	Sept. 1-7	Latitude 14.3° N., longitude 48.5° W.	New Brunswick	150 m.p.h., estimated	27.45 in.	Over Gulf of St. Lawrence	Hurricane	Maine fishermen lost an estimated \$1,000,000 worth of fishing gear, mostly lobster pots. Some damage in New Brunswick and Nova Scotia. Loss of one life at sea.
DOLLY	Sept. 8-13	Near latitude 21° N. longitude 69° W.	None	115 m.p.h., estimated	29.72 in.	Latitude 42° N., longitude 48° W.	Hurricane	Did not pass over any land area but close to Puerto Rico and Bermuda.
EDNA	Sept. 14-19	Near latitude 20° N. longitude 66° W.	None	125 m.p.h.	29.85 in.	Latitude 43° N., longitude 45° W.	Hurricane	Passed very close to Bermuda and caused considerable damage. Winds reached 120 m.p.h. in gusts on the island.
FLORANCE	Sept. 23-26	100 mi. S.E. of Jamaica	Florida	127-138 m.p.h., estimated	29.26 in.	Vicinity of Albany, Ga.	Hurricane	Damage over extreme northwest Florida estimated at \$100,000 to \$200,000. In southeastern Alabama damage was \$3,162,500, of which \$3,002,000 was to crops.
GAIL	Oct. 2-5	Near latitude 14° N., longitude 37° W.	None	75-80 m.p.h.	29.12 in.	Latitude 12° N., longitude 48° W.	Less than hurricane	Did not reach any land area.
HAZEL	Oct. 8-10	In Yucatan Channel	Florida	60-75 m.p.h., sustained speed. 80 m.p.h. in gusts due to tornadic effects at Okeechobee City	29.15 in.	Latitude 37° N., longitude 64.4° W.	Near hurricane	Hurricane intensity at one point due to tornadic effect. Wind damage estimated at \$250,000 in Florida. Storm rains added to the damage in the already flooded valleys.

# SHIPS OBSERVATIONS

Observations from ships operating in the vicinity of tropical storms during the 1953 season.

Table 18b

Ship (Nationality)	Voyage		Position of		Date and time (G.C.T.)	Wind speed (knots)	Baro- meter (in.)	Remarks
	from	to	Ship	Storm				
Tanker Gulfdisc, Am.	Port Arthur	Charleston	24.6°N. 83.5°W.	19.8°N. 82.7°W.	May 30, 6a.	40	29.91	Intermittent rain. Waves 6 1/2 ft. high.
Del Campo (Frt.), Am.	New Orleans	Dakar	26.3°N. 85.6°W.	25.8°N. 85°W.	June 5, Mdt.	40	29.67	Clouds generally forming. Waves 14 ft. high.
			25.1°N. 84.8°W.	26.5°N. 85.3°W.	June 5, 6a.	47	29.78	Waves 16 ft. high.
S.S. Andrew Jackson, Am.	Panama Canal	New York	29.3°N. 74.0°W.	30.0°N. 76.0°W.	Aug. 12, 6p.	48	29.94	Moderate continuous rain. Waves 13 ft. high.
			29.3°N. 73.9°W.	30.5°N. 76.0°W.	Aug. 13, Mdt.	47	29.97	Moderate intermittent rain. Waves 13 ft. high.
S.S. African Star, Am. (Special report)	Savannah, Ga.	Walvis Bay, S.W. Africa	31.0°N. 77.1°W.	29°58'N. 76°W.	Aug. 12, 6p.	22-26	29.86	Had changed course to avoid danger area of storm. Was 90 mi. NNW of center.
S.S. South Carolina, Am.	Claymont, Del.	Louisiana	31.4°N. 76.7°W.	31.0°N. 76.0°W.	Aug. 13, 2a.	40	29.88	Rain. Waves 11 ft. high.
Tanker Five Forks, Am.	New London, Conn.	Houston, Tex.	32.6°N. 73.3°W.	33.2°N. 76.3°W.	Aug. 13, 3p.	45	29.98	Squalls. Waves 16 ft. high.
			32.1°N. 73.2°W.	33.5°N. 76.4°W.	Aug. 13, 6p.	46	29.95	Squalls. Waves 29 ft. high.
S.S. Esso Norfolk, Am.	Boston	Baytown, Tex.	32.1°N. 75.6°W.	31.6°N. 76.0°W.	Aug. 13, 6a.	50	29.64	Violent rain showers. Waves 21 ft. high.
			31.2°N. 76.0°W.	32.5°N. 76.4°W.	Aug. 13, 12m.	45	29.70	Rain showers. Waves 21 ft. high.
S.S. Esso Chattanooga, Am.	Philadelphia	Baytown, Tex.	31.7°N. 73.9°W.	31.0°N. 76.0°W.	Aug. 13, 4a.	40	29.94	Squalls. Waves 13 ft. high.
S.S. Montana, Am.	Portland, Me.	Port Arthur, Tex.	32.0°N. 74.4°W.	30.5°N. 76.0°W.	Aug. 13, Mdt.	40	29.94	Squalls. Waves 16 ft. high.
			31.0°N. 75.0°W.	32.5°N. 76.3°W.	Aug. 13, 12m.	45	29.69	Squalls. Waves 24 ft. high.
Tanker Atlantic Dealer, Am.	Rensselaer, N. Y.	Port Arthur, Tex.	32.7°N. 75.6°W.	32.5°N. 76.3°W.	Aug. 13, 12m.	48	29.66	Waves 21 ft. high.
			31.9°N. 75.4°W.	33.5°N. 76.4°W.	Aug. 13, 6p.	45	29.90	Waves 8 ft. high.
S.S. Esso New Haven, Am.	New York	Galveston	32.3°N. 74.0°W.	32.5°N. 76.3°W.	Aug. 13, 12m.	40	29.93	Heavy intermittent rain. Waves 14 ft. high.
			32.0°N. 74.0°W.	33.0°N. 76.0°W.	Aug. 13, 3p.	40	29.94	Heavy intermittent rain. Waves 14 ft. high.
Evelyn, Am.	Baltimore	Rios-Jamaica	31.3°N. 73.7°W.	33.0°N. 76.3°W.	Aug. 13, 3p.	40	29.92	Slight intermittent rain. Waves 14 ft. high.
Tanker Gulf Meadows, Am.	Corpus Christi	Norfolk	34.3°N. 75.7°W.	33.0°N. 76.3°W.	Aug. 13, 3p.	45	29.82	Moderate intermittent rain. Waves 21 ft. high.
			34.8°N. 75.3°W.	33.5°N. 76.5°W.	Aug. 13, 6p.	38	29.76	Drizzle. Waves 21 ft. high.
Tanker Esso Havana, Am.	New York	Harbor Is., Tex.	33.5°N. 72.3°W.	36.0°N. 76.0°W.	Aug. 14, 6a.	40	29.96	Waves 11 ft. high.
Tanker Atlantic Voyager, Am.	Philadelphia	Las Piedras, Ven.	38.0°N. 74.4°W.	37.3°N. 75.3°W.	Aug. 14, 2p.	65	29.50	Rain. Waves 11 ft. high.
			37.9°N. 74.4°W.	37.8°N. 74.8°W.	Aug. 14, 5p.	70	29.29	Rain. Waves 14 ft. high.
			37.3°N. 74.0°W.	39.0°N. 73.5°W.	Aug. 14, Mdt.	60	29.70	Rain. Waves 11 ft. high.
New Zealand Victory, Am.	Philadelphia	Cristobal, C. Z.	36.5°N. 74.6°W.	36.0°N. 76.0°W.	Aug. 14, 6a.	50	29.79	Squalls. Waves 8 ft. high.
			35.0°N. 73.8°W.	37.0°N. 75.5°W.	Aug. 14, 12m.	50	29.64	Slight intermittent rain. Waves 9 1/2 ft. high.
S.S. Excalibur, Am.	New York	Barcelona	40.3°N. 73.1°W.	39.0°N. 73.4°W.	Aug. 15, Mdt.	50	29.59	Heavy continuous rain.
S.S. Independence, Am.	New York	Gibraltar	39.9°N. 63.2°W.	43.0°N. 63.0°W.	Aug. 15, 6p.	40	29.85	
S.S. Santa Ines, Am.	New York	Cristobal, C. Z.	38.8°N. 75.0°W.	39.0°N. 73.5°W.	Aug. 15, Mdt.	40	29.73	
Dutch S.S. Nieuw Amsterdam	Rotterdam	New York	39.2°N. 70.0°W.	40.4°N. 69.7°W.	Aug. 15, 6a.	54	29.35	Waves 24 ft. high.
S.S. American Jurist	Rotterdam	New York	43.1°N. 58.2°W.	44.5°N. 60.8°W.	Aug. 16, Mdt.	55	29.64	Squalls.
S.S. Eucadia, British	Glasgow	New York	42°54'N. 56°42'W.	45.0°N. 60.0°W.	Aug. 16, 2a.	34-40	29.69	Overcast with rain squalls. Very rough seas.
			42°53'N. 56.5°W.	45.3°N. 57.3°W.	Aug. 16, 3a.	41-47	29.71	Overcast. Very high seas.
Queen of Bermuda, Br.	New York	Bermuda	33.5°N. 69.0°W.	32.5°N. 69.7°W.	Sept. 6, 9a.	50	28.84	
			33.4°N. 68.7°W.	33.2°N. 69.6°W.	Sept. 6, 12m.	50	28.73	Heavy continuous rain.
			33.5°N. 68.6°W.	34.3°N. 70.1°W.	Sept. 6, 3p.	60	28.98	Rain. Waves 50 ft. high.
			33.3°N. 68.1°W.	29.9°N. 70.4°W.	Sept. 6, 6p.	50	29.51	Rain.
Swedish Gripsholm	Gothenburg	New York	39.6°N. 65.6°W.	40.5°N. 69.2°W.	Sept. 7, 12m.	48	29.63	Rain showers.
			39.6°N. 66.0°W.	42.4°N. 68.2°W.	Sept. 7, 3p.	50	29.73	Slight rain showers.
Ile de France	Le Havre	New York	41.1°N. 66.0°W.	43.2°N. 66.2°W.	Sept. 7, 6p.	60	29.59	
S.S. Alcoa Pointer, Am.			21.0°N. 67.5°W.	18.0°N. 64.0°W.	Sept. 9, Mdt.	45	29.86	
S.S. Siwanoy, Am.	Paulsboro, N.J.	Port La Cruz	22.4°N. 68.7°W.	22.5°N. 70.2°W.	Sept. 10, Mdt.	50	29.72	Squalls. Waves 11 ft. high.
S.S. Gulfglow, Am.	Puerto Lacruz, Ven.	Philadelphia	24.8°N. 69.0°W.	26.4°N. 70.6°W.	Sept. 11, Mdt.	50	29.74	Slight continuous drizzle.
Tanker Sheldon Clark, Am.	Venezuela	Marcus Hook, Pa.	24.4°N. 68.9°W.	22.9°N. 69.6°W.	Sept. 16, Mdt.	50	29.85	Rain showers. Waves 11 ft. high.
S.S. Evergreen State, Am.	Glasgow	Mobile	27.5°N. 68.0°W.	25.5°N. 71.4°W.	Sept. 16, 3p.	40	29.91	Waves 16 ft. high.
			27.5°N. 67.7°W.	26.3°N. 71.2°W.	Sept. 16, 6p.	40	29.88	Waves 19 ft. high.



# SHIPS OBSERVATIONS

Observations from ships operating in the vicinity of tropical storms during the 1953 season.

Table 18b—Continued

Ship (Nationality)	Voyage		Position of		Date and time (G.C.T.)	Wind speed (knots)	Baro- meter (In.)	Remarks
	from	to	Ship	Storm				
Tanker Cantigny, Am.	Lake Charles, La.	Norfolk, Va.	24.4°N. 83.6°W.	20.0°N. 83.9°W.	Sept. 24, 12m.	40	29.94	Moderate intermittent rain.
			24.3°N. 82.3°W.	23.9°N. 87.2°W.	Sept. 24, 6p.	35	29.93	Waves 11 ft. high. Precipitation within sight.
			24.7°N. 80.7°W.	22.4°N. 86.6°W.	Sept. 24, Mdt.	40	29.98	Waves 11 ft. high. Rain showers. Waves 11 ft. high.
S.S. Esso Reading, Am.	Baytown, Tex.	New Haven, Conn.	26.3°N. 85.2°W.	26.3°N. 87.5°W.	Sept. 26, 6p.	40	29.70	Heavy continuous rain.
Tanker Redstone	Houston, Tex.	Wilmington, N.C.	26.0°N. 86.6°W.	25.0°N. 87.6°W.	Sept. 25, 12m.	45	29.68	Squalls. Waves 14 ft. high.
			25.9°N. 86.2°W.	25.7°N. 87.5°W.	Sept. 25, 3p.	40	29.70	Squalls. Waves 13 ft. high.
			25.9°N. 85.8°W.	26.3°N. 87.4°W.	Sept. 25, 6p.	40	29.66	Squalls. Waves 19 ft. high.
S.S. St. Mary, Am.	New Orleans	La Ceiba and Pt. Barrios	22.4°N. 86.6°W.	23.2°N. 86.8°W.	Sept. 25, 3a.	70	29.49	Rain.
S.S. Alcoa Runner, Am.	Mobile	West Indies	28.2°N. 84.2°W.	27.5°N. 87.2°W.	Sept. 26, Mdt.	47	29.74	Heavy intermittent rain.
S.S. David McKelvy	Bighorn	New York	31.7°N. 79.3°W.	28.8°N. 79.0°W.	Oct. 9, Mdt.	40	29.81	Squalls. Waves 11 ft. high.
			32.2°N. 77.0°W.	32.5°N. 73.4°W.	Oct. 10, 12m.	55	29.69	Squalls. Waves 11 ft. high.
			34.1°N. 76.0°W.	34.4°N. 69.6°W.	Oct. 10, 6p.	47	29.71	Squalls. Waves 11 ft. high.
			35.3°N. 75.2°W.	35.5°N. 67.5°W.	Oct. 10, Mdt.	45	29.79	Squalls.
S.S. Helen Lykes, Am.	Ancona	Tampa	25.6°N. 83.0°W.	27.5°N. 81.0°W.	Oct. 9, 12m.	55	29.49	Moderate continuous rain.

Only those observations with winds of 40 knots or higher are included.

# NORTH ATLANTIC HURRICANES AND TROPICAL DISTURBANCES FOR PAST YEARS

Table 18.-- Frequency of tropical storms by month and season and number of storms reaching hurricane intensity

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1922									
Number of tropical storms	0	1	0	0	2	2	0	0	5
Number of hurricanes	0	0	0	0	1	1	0	0	2
1923									
Number of tropical storms	0	0	0	0	2	3	0	0	5
Number of hurricanes	0	0	0	0	1	1	0	0	2
1924									
Number of tropical storms	0	1	0	2	2	2	1	0	8
Number of hurricanes	0	0	0	2	1	1	0	0	4
1925									
Number of tropical storms	0	0	0	1	1	0	0	1	3
Number of hurricanes	0	0	0	0	0	0	0	1	1
1926									
Number of tropical storms	0	0	1	2	5	1	1	0	10
Number of hurricanes	0	0	1	2	3	1	0	0	7
1927									
Number of tropical storms	0	0	0	1	3	2	1	0	7
Number of hurricanes	0	0	0	1	1	0	0	0	2
1928									
Number of tropical storms	0	0	0	2	3	1	0	0	6
Number of hurricanes	0	0	0	1	1	1	0	0	3
1929									
Number of tropical storms	0	1	0	0	1	0	0	0	2
Number of hurricanes	0	1	0	0	1	0	0	0	2
1930									
Number of tropical storms	0	0	0	1	1	0	0	0	2
Number of hurricanes	0	0	0	1	1	0	0	0	2
1931									
Number of tropical storms	0	1	1	1	3	1	1	0	8
Number of hurricanes	0	0	0	0	2	0	0	0	2
1932									
Number of tropical storms	1	0	0	2	4	2	2	0	11
Number of hurricanes	0	0	0	2	2	0	2	0	6
1933									
Number of tropical storms	1	1	3	6	6	3	1	0	21
Number of hurricanes	0	1	1	2	4	2	0	0	10
1934									
Number of tropical storms	1	1	1	2	2	3	1	0	11
Number of hurricanes	0	1	0	1	1	1	1	0	5
1935									
Number of tropical storms	0	0	0	1	2	1	1	0	5
Number of hurricanes	0	0	0	1	2	1	1	0	5
1936									
Number of tropical storms	0	3	2	6	5	1	0	0	17
Number of hurricanes	0	1	1	1	2	0	0	0	5
1937									
Number of tropical storms	0	0	1	2	5	1	0	0	9
Number of hurricanes	0	0	0	0	2	0	0	0	2
1938									
Number of tropical storms	0	0	0	3	1	3	1	0	8
Number of hurricanes	0	0	0	3	1	0	0	0	4
1939									
Number of tropical storms	0	1	0	1	1	1	1	0	5
Number of hurricanes	0	0	0	0	0	1	1	0	2
1940									
Number of tropical storms	1	0	0	3	2	2	0	0	8
Number of hurricanes	0	0	0	3	1	0	0	0	4
1941									
Number of tropical storms	0	0	0	0	4	2	0	0	6
Number of hurricanes	0	0	0	0	3	1	0	0	4
1942									
Number of tropical storms	0	0	0	3	1	3	1	0	8
Number of hurricanes	0	0	0	1	0	0	1	0	2
1943									
Number of tropical storms	0	0	1	2	4	3	0	0	10
Number of hurricanes	0	0	1	1	2	1	0	0	5
1944									
Number of tropical storms	0	0	2	3	3	2	0	0	10
Number of hurricanes	0	0	1	2	2	1	0	0	6
1945									
Number of tropical storms	0	1	1	4	3	1	0	0	10
Number of hurricanes	0	1	0	1	1	1	0	0	4
1946									
Number of tropical storms	0	1	1	1	1	1	1	0	6
Number of hurricanes	0	0	0	0	1	1	0	0	2
1947									
Number of tropical storms	0	0	1	3	3	3	0	0	10
Number of hurricanes	0	0	0	1	1	2	0	0	4

Table 19.-- Frequency of tropical storms by month and season and number of (Cont'd.) storms reaching hurricane intensity

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1948									
Number of tropical storms	2	0	1	2	3	1	1	0	10
Number of hurricanes	0	0	0	1	3	1	0	0	5
1949									
Number of tropical storms	0	0	0	3	5	2	1	0	11
Number of hurricanes	0	0	0	2	3	2	1	0	8
1950									
Number of tropical storms	0	0	0	3	3	6	0	0	12
Number of hurricanes	0	0	0	3	3	5	0	0	11
1951									
Number of tropical storms	1	0	0	2	4	3	0	0	10
Number of hurricanes	1	0	0	1	3	3	0	0	8
1952									
Number of tropical storms	0	0	0	1	3	2	0	0	6
Number of hurricanes	0	0	0	1	3	2	0	0	6
1953									
Number of tropical storms	1	0	0	1	4	2	0	0	8
Number of hurricanes	0	0	0	1	4	0	0	0	5

Table 19a.--Total number of tropical storms by month and season and number reaching hurricane intensity for period 1887 to 1953

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1887 to 1953									
Number of tropical storms	9	26	31	97	172	127	32	3	497
Number of hurricanes	1	10	15	60	106	52	8	1	253

Storms are listed under the month in which they ran most of their course.

Table 19b.--Total number of tropical storms and loss of life and damage in the United States, 1915-1941

Year	Total number of occurrences	Number reaching United States Coast	Loss of life in United States	Damage in United States
1915	5	2	550	\$ 63,000,000
1916	13	3	107	33,324,000
1917	2	1	5	170,000
1918	4	1	34	5,000,000
1919	4	1	287	22,000,000
1920	4	2	2	3,000,000
1921	5	1	5	3,000,000
1922	5	0	0	0
1923	5	1	0	19,300
1924	8	1	2	Minor
1925	3	1	6	Minor
1926	10	3	269	106,500,000
1927	7	0	0	0
1928	6	3	1,836	25,000,000
1929	2	2	0	653,000
1930	2	1	0	Negligible
1931	8	3	0	0
1932	11	5	0	0
1933	21	5	63	45,650,000
1934	11	4	17	4,760,000
1935	5	2	414	11,500,000
1936	6	6	9	2,300,000
1937	9	5	0	42,500
1938	8	4	600	300,245,000
1939	5	3	3	2,000
1940	8	2	51	4,743,550
1941	6	4	10	7,675,000
Total	194	66	4,273	\$ 638,584,350
Mean	7.2	2.4	158.2	23,651,272

Table 19c.-- Total number, loss of life, and damage in all areas, and in the United States, 1942 to 1953\*

Year	Total number		Loss of Life		Damage	
	In all areas	Reaching U.S. Coast	Total all areas	In United States	Total all areas	In United States
1942	8	3	17	8	\$ 31,101,000	\$ 27,101,000
1943	10	4	19	16	16,765,000	16,765,000
1944	10	4	1,076	64	202,010,000*	165,010,000
1945	10	5	29	7	80,133,000*	80,133,000
1946	6	4	5	0	5,200,000*	5,200,000
1947	10	8	72	53	135,757,500	135,757,500
1948	10	5	24	3	24,400,000*	18,400,000
1949	11	3	4	4	59,762,000	58,750,000
1950	12	4	27	19	36,425,000*	35,850,000
1951	10	1	244	0	25,045,000*	2,000,000
1952	6	1	16	3	3,750,000*	2,750,000
1953	8	4	3	2	6,162,500*	6,162,500
Total	111	46	1,536	179	\$627,011,000	\$553,879,000
Mean	9.3	3.8	128	15	52,250,917	46,156,583

\* Considerable additional damage for which figures are not available.

\* Loss of life and damage not available outside of United States prior to 1942.



## GENERAL SUMMARY OF FLOOD LOSSES FOR 1953

Monetary losses from floods in the United States during 1953 are estimated at \$122,200,000, which is about 50 percent of the 1952 flood loss or about 12 percent of the record flood loss of \$1,028,742,000 in 1951. In comparison with the national annual average of \$275,000,000 (based on the 10-year period, 1942-1951, adjusted to the 1951 price index) the flood losses in 1953 were equal to 44.4 percent. The total loss of life was 40 in 1953 as compared to 54 in 1952, 51 in 1951, and 93 in 1950. It was considerably less than the national annual average of 75 lives for the last 32 years. The savings resulting

from the flood forecasting and warning service was, as compiled from fragmentary information, approximately \$12,000,000--undoubtedly this figure was much greater as savings were reported from only 40 percent of the river systems reporting flooding during the year.

The floods in Louisiana and Texas during April and May, and the floods in northwestern Iowa in the Big Sioux, Floyd, and Little Sioux Rivers in June, were the most important floods of 1953. The damages sustained in these floods were relatively small in comparison to the big floods of 1951 and 1952.

Table P 1 ESTIMATED FLOOD LOSSES FOR 1953

River and drainage	Urban Property				Rural Property				Other Property		Miscellaneous	Unclassified	Total Loss	Lives Lost	
	Residential		Commercial		Public	Crops		Livestock	Other						
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable					
HUDSON BAY DRAINAGE															
Red River of the North.....	\$51,400	\$15,000	\$22,200	\$6,000	\$42,200	\$2,225,000	\$25,000	\$15,000	\$70,000	\$20,000	\$150,000	\$2,000	\$10,000	\$2,653,800	1
Total.....	51,400	15,000	22,200	6,000	42,200	2,225,000	25,000	15,000	70,000	20,000	150,000	2,000	10,000	2,653,800	1
ATLANTIC SLOPE DRAINAGE															
Saco and Androscoggin Rivers and minor tributaries.....	20,000		3,000		550,000						1,000,000		9,000,000	10,000,000	1
Pemigewasset River.....					550,000						12,000	5,000	47,000	637,000	...
Pee Dee, Savannah, Ogeechee, Oconee, Ocmulgee, and Altamaha Rivers.....						97,500							11,300	108,800	...
Total.....	20,000		3,000		550,000	97,500					1,012,000	5,000	9,058,300	10,745,800	1
EAST GULF OF MEXICO DRAINAGE															
Choctawhatchee River.....	400				3,700	5,500	1,000	2,500	5,000		72,800		17,000	107,900	2
Conecuh River and minor tributaries.....		30,000						800			339,200			370,000	...
Coosa and Alabama Rivers.....						**437,000								437,000	...
Tallapoosa River.....						98,000								98,000	...
Black Warrior, Tombigbee, and Chickasaw Rivers.....						46,500								46,500	...
Bogue Chitto River.....	1,000	100	4,000			2,000			500		109,800			117,400	...
Leaf and Pearl Rivers.....	40,000					1,224,000							3,000	1,267,000	...
Total.....	41,400	30,100	4,000		3,700	1,813,000	1,000	3,300	5,500		521,800		20,000	2,443,800	2
MISSISSIPPI SYSTEM															
Upper Mississippi Basin															
Minnesota River.....	117,200	68,800	25,000	7,000	72,500	2,785,000	20,000	14,000	147,000	25,800	310,000	7,800	39,500	3,638,000	...
Zumbro River.....					2,000	28,000	2,000	1,000	3,200		2,000			38,200	...
Whitewater, La Crosse, and Root Rivers.....	6,000				2,000	25,800	5,000	1,000	2,500		2,500		# 1,000	45,800	...
Upper Iowa and Wisconsin Rivers.....		5,900				325,000	2,000	5,000	18,000		25,100		19,000	# 400,000	2
Turkey and Wapsipiticon Rivers.....	3,100					712,100			4,500		2,000			# 721,700	...
Pecatonica River.....			49,500							70,000		19,000		# 138,500	...
Cedar, Racoon, and Des Moines Rivers.....	4,500		12,000		13,000	8,500		500		1,500		4,000		44,000	...
Mississippi River.....	5,000		3,000		45,000	455,000	2,000	25,000	8,000	2,000	26,000		5,000	# 576,000	...
Total.....	135,800	74,700	89,500	7,000	134,500	4,339,400	31,000	46,500	183,200	98,500	367,600	30,000	63,500	5,602,200	2
Missouri Basin															
East Gallatin and Sun Rivers.....	159,900		12,900		15,000	103,900			296,500		108,700		192,700	# 889,600	...
Teton River.....	10,300				11,000	5,700			65,000		307,900		3,600	# 403,500	...
Marais River and minor tributaries.....	23,000		27,000		30,000	461,500			720,200		940,400		11,900	#2,214,000	...
Judith River.....	33,800		15,200		9,000	35,900			48,400		76,500		19,800	# 238,600	...
Milk River.....	42,700		3,900		12,300	423,300			342,400		109,100		73,300	#1,007,000	...
Big Horn, Powder, Heart, and James Rivers.....	32,400				200	10,000			34,800		45,200		8,000	# 130,600	...
Big Sioux River and tributaries.....	# 216,300					523,300					78,100		149,200	# 966,900	...
Floyd River.....	4,160,000	3,900,000	2,500,000	4,050,000	800,000	750,000	650,000	75,000	800,000	65,900	8,000,000	540,000	3,490,000	#28,880,900	14
Little Sioux River.....	# 290,500					1,897,300					451,600		164,000	# 3,103,400	...
North Fork of Elkhorn River.....	5,000					35,000					20,000			60,000	...
Republican and Smoky Hill Rivers.....	7,700	300	6,400	300	155,800	553,000	1,500	3,100	4,500	2,500	708,400	49,300	121,000	1,615,800	...

See reference notes at end of table.



ESTIMATED FLOOD LOSSES FOR 1953

Table F 1--Continued

River and drainage	Urban Property				Rural Property				Other Property		Miscellaneous	Unclassified	Total Loss	Lives Lost		
	Residential		Commercial		Public	Crops		Livestock	Other						RR's, bridges, Highways, etc., Utilities	
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable						
MISSISSIPPI SYSTEM--CONT.																
Missouri Basin--Cont.																
Missouri River and minor tributaries.....	\$463,700		\$124,500		\$167,500	\$280,000				\$834,200		\$2,579,800		\$294,900	\$4,744,600	...
Total.....	5,445,300	\$3,000,300	2,689,900	\$4,050,300	1,200,800	5,078,900	\$651,500	\$78,100	3,146,000	\$68,400	13,425,700	\$589,300		4,830,400	44,254,900	14
Ohio Basin																
Upper Allegheny and Clarion Rivers.....	193,800				148,200							38,000			380,000	...
Tributaries of Little Kanawha River.....			5,000		3,000	50,000		100	20,000	5,000	10,000			5,000	98,100	...
Greenbrier and Elk Rivers.....	69,500	23,000	3,000	3,000	62,000	47,500		1,500	5,000	3,000	33,000				# 250,500	3
Levisa Fork, Green River, and Raccoon Creek .....	5,500			5,000	18,000	10,600			7,000					3,000	49,100	2
Total.....	268,800	23,000	8,000	8,000	231,200	108,100		1,600	32,000	8,000	81,000			8,000	777,700	5
Arkansas Basin																
Walnut and Whitewater Rivers, and Blood Creek.....	535,000	284,000	205,000	232,000	170,000	85,000	11,000	7,500	32,000		101,000	50,000		232,000	1,944,500	2
Poteau River.....					5,000			3,000	800	2,000	3,000			1,000	14,800	...
Tributaries of Arkansas River in Colorado.....											61,000				61,000	...
Total.....	535,000	284,000	205,000	232,000	175,000	85,000	11,000	10,500	32,800	2,000	165,000	50,000		233,000	2,020,300	2
Red Basin																
Ouachita River.....	4,500	500	5,000		1,000	12,000		9,000	4,000		2,000			21,000	59,000	...
Red River.....	60,000				10,000	901,500	3,000	475,000	123,000	22,000	228,000			179,000	2,001,500	...
Total.....	64,500	500	5,000		11,000	913,500	3,000	484,000	127,000	22,000	230,000			200,000	2,060,500	...
Lower Mississippi Basin																
Yazoo River.....						4,310,000					636,000				# 4,946,000	...
Mississippi River and minor tributaries.....						#2,462,000					252,000	160,000		37,000	# 2,911,000	12*
Total.....						6,772,000					888,000	160,000		37,000	7,857,000	12
WEST GULF OF MEXICO DRAINAGE																
Vermillion River.....	2,000				1,000	25,000	500	500	1,000	1,000	1,000	500		2,000	34,500	...
Nezperque River.....						300,000	5,000	100,000	150,000	50,000	100,000	25,000		75,000	805,000	...
Mermentau River.....	40,500	7,000	125,000	25,000	50,000	500,000	10,000	200,000	250,000	100,000	400,000	25,000		150,000	1,882,500	...
Calcasieu River.....	11,800,000	1,500,000	600,000	400,000	1,000,000	5,000,000	10,000	650,000	2,000,000	500,000	1,500,000	50,000		600,000	24,810,000	...
Sabine River.....	175,000	200,000	100,000	100,000	100,000	2,505,000	10,000	37,000	300,000	50,000	200,000	50,000		500,000	4,327,000	1
Trinity River and tributaries.....						1,659,000					32,100	4,900			# 2,194,000	...
Lavaca, Navidad, and Guadalupe Rivers.....						24,000									24,000	...
Neches River.....	96,000	32,000	18,000	11,000	340,000				22,000	4,000	149,500	25,000		74,000	771,500	...
Total.....	11,313,500	1,739,000	843,000	536,000	1,491,000	10,013,000	35,500	987,500	2,723,000	705,000	2,382,600	180,400		1,899,000	34,848,500	1
PACIFIC SLOPE DRAINAGE																
Colorado Basin																
Coal Creek Canyon.....					700	5,000					600	1,200			7,500	...
Total.....					700	5,000					600	1,200			7,500	...
Columbia Basin																
Kootenai and Clark Fork Rivers.....	5,000				4,500	27,000				200	80,000			7,000	123,700	...

See reference notes at end of table.

Table F 1--Continued

## ESTIMATED FLOOD LOSSES FOR 1953

River and drainage	Urban Property				Rural Property				Other Property		Miscellaneous	Unclassified	Total Loss	Lives Lost	
	Residential		Commercial		Public	Crops		Livestock	Other						
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable					
PACIFIC SLOPE DRAINAGE--CONT. Columbia Basin--Cont.	\$50,000	\$10,000	\$15,000	\$40,000	\$50,000	\$25,000	\$15,000	\$50,000	\$50,000	.....	\$1,756,500	\$10,000	\$553,500	\$2,625,000	...
	55,000	10,000	15,000	40,000	54,500	52,000	15,000	50,000	50,000	\$200	1,836,500	10,000	560,500	2,748,700	...
	.....	.....	74,100	26,400	312,300	46,000	2,000	3,700	67,900	4,400	5,000	2,500	426,000	.....	.....
	202,000	51,000	421,000	118,000	378,000	94,600	22,600	1,500	97,300	5,000	22,000	36,000	609,000	.....	.....
	56,000	20,000	300,000	80,000	121,000	69,500	2,000	1,000	15,000	4,000	2,000	5,000	387,000	.....	.....
Coastal Drainage	2,500	4,000	60,000	120,000	205,700	102,300	3,000	8,000	148,000	7,900	29,900	1,000	427,400	.....	.....
	12,300	6,000	30,000	33,800	64,000	50,500	4,000	2,000	73,200	3,300	137,000	1,500	342,600	.....	.....
	.....	.....	.....	.....	.....	170,000	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous Basins	272,800	81,000	885,100	378,200	1,081,000	532,900	33,600	16,200	401,400	24,600	195,900	46,000	2,192,000	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grand Total.....	18,203,500	5,257,600	4,769,700	5,257,500	4,975,600	32,035,300	806,600	1,692,700	6,770,900	948,700	21,298,700	1,073,900	19,111,700	\$1,000	122,203,400
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40

\* Coordinated with U. S. Engineers.

† U. S. Engineers figures of Louisiana during May - June floods.

\* Total for all states of Louisiana.

† Includes all urban property.

\*\* Includes all rural property.



# LOSS OF LIFE AND PROPERTY IN THE UNITED STATES FROM FLOODS

Table F 2

BY DISTRICTS AND YEARS\*, 1902-53

District	1902-03		1903-04		1904-05		1905-06		1906-07	
	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property
North Atlantic-----	---	\$-----	---	\$ 4,350,000	---	---	---	---	---	\$ 1,000,000
South Atlantic-----	61	4,500,000	---	---	---	---	---	---	---	---
Ohio Valley-----	---	176,000	---	75,000	---	---	---	---	7	8,963,000
Upper Mississippi-----	100	40,425,000	---	100,000	2	10,400,000	1	400,000	---	103,000
Lower Mississippi-----	1	500,000	---	20,000	---	100,000	---	---	---	500,000
Texas-----	16	5,015,000	---	---	---	---	---	---	---	---
Pacific-----	a	2,500,000	---	2,000,000	---	500,000	---	---	---	5,010,000
Total	178	53,116,000	---	6,545,000	2	11,000,000	1	400,000	7	15,576,000

District	1907-08		1908-09		1909-10		1910-11		1911-12	
	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property
North Atlantic-----	---	---	---	239,000	---	685,000	---	---	---	---
South Atlantic-----	---	---	---	3,188,000	---	364,000	---	---	---	895,000
East Gulf-----	---	---	5	1,509,000	---	---	---	3,500	---	69,500
Ohio Valley-----	---	---	---	390,000	---	1,335,000	---	5,710,000	---	1,604,000
Upper Mississippi-----	---	---	---	c15,631,000	---	11,680,000	---	75,000	---	3,514,000
Lower Mississippi-----	---	b3,250,000	---	d 4,730,000	---	500,000	---	273,000	---	70,000,000
Arkansas-----	---	---	---	2,825,000	---	1,265,200	---	---	---	203,500
Red-----	---	---	---	18,000,000	---	---	---	---	---	---
Texas-----	11	5,000,000	---	---	---	---	---	---	---	---
Pacific-----	---	---	---	2,622,000	---	5,410,000	---	1,711,000	2	1,300,000
Total	11	8,250,000	5	49,134,000	---	21,239,200	---	7,772,500	2	77,586,000

\*Fiscal years (July 1 to June 30) through June 30, 1924 and calendar years thereafter.

a Large number

b Arkansas and Canadian Rivers

c \$8,771,000 in States of Missouri and Kansas

d \$3,420,000 in Oklahoma

# LOSS OF LIFE AND PROPERTY IN THE UNITED STATES FROM FLOODS

Table F 2--Continued

BY DISTRICTS AND YEARS\*, 1902-53

District	1912-13		1913-14		1914-15		1915-16		1916-17		1917-18	
	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property
Great Lakes-----	---	\$-----	---	\$-----	---	---	30	\$ 3,172,000	---	---	---	\$-----
North Atlantic-----	---	1,303,500	---	87,000	---	16,100	4	1,200,000	---	372,125	---	216,000
South Atlantic-----	---	264,000	---	24,950	---	45,143	4	---	---	22,945,435	---	968,000
East Gulf-----	---	148,000	---	57,000	---	160,000	---	---	80	---	---	203,500
Ohio Valley-----	527	156,331,000	---	1,641,753	---	112,250	---	1,500,000	---	1,526,900	---	3,417,000
Upper Mississippi-----	---	550,000	---	162,700	---	9,018,500	36	4,435,641	---	2,439,500	---	800,000
Lower Mississippi-----	---	12,081,451	---	f 1,065,000	---	36,400	---	1,364,393	---	---	---	115,000
Arkansas-----	---	---	---	80,390	---	560,000	---	6,255,280	---	---	---	1,500,000
Red-----	---	---	---	---	---	1,540,000	---	633,000	---	---	---	21,000
Texas-----	---	---	180	11,058,915	41	2,317,607	---	413,132	---	---	---	157,500
Pacific-----	---	710,000	---	3,773,992	---	325,000	---	---	---	46,125	---	269,000
Miscellaneous east	---	---	---	---	---	---	22	2,055,620	---	---	---	---
of Rockies-----	---	---	---	---	---	---	26	5,084,934	---	---	---	---
Miscellaneous west	---	---	---	---	---	---	---	---	---	---	---	---
of Rockies-----	---	---	---	---	---	---	---	---	---	---	---	---
Total	527	171,387,951	180	17,951,700	49	14,131,000	118	26,124,000	80	27,330,085	---	7,867,000

District	1918-19		1919-20		1920-21		1921-22		1922-23		1923-24	
	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property
Great Lakes-----	---	34,900	---	7,000	---	---	---	---	---	---	---	---
North Atlantic-----	---	100,915	---	400,000	---	30,000	---	4,000,000	---	4,060,000	5	8,067,400
South Atlantic-----	---	666,390	---	4,178,715	---	150,000	---	75,000	---	32,690	---	3,465
East Gulf-----	---	169,730	20	5,000,000	---	1,310,000	---	35,000	---	410,600	---	59,650
Ohio Valley-----	2	593,525	---	3,000,000	---	150,000	---	4,800,000	---	74,300	11	3,408,970
Upper Mississippi-----	---	171,000	22	4,000,000	---	---	---	4,750,000	1	2,000,000	19	1,788,000
Lower Mississippi-----	---	50,000	---	3,000,000	---	g 445,000	---	8,085,750	---	290,000	---	---
Arkansas-----	---	25,500	---	200,000	143	25,000,000	---	1,014,250	9	h24,859,500	2	15,968,410
Red-----	---	155,000	---	1,800,000	---	100,000	---	---	---	---	---	158,400
Texas-----	---	875,000	---	2,810,500	---	530,000	215	27,000,000	---	204,000	---	192,500
Pacific-----	---	322,040	---	375,000	---	932,000	---	2,300,000	---	297,150	---	46,739
Miscellaneous east	---	---	---	---	---	---	---	---	3	1,705,000	---	---
of Rockies-----	---	---	---	---	---	---	---	---	---	---	9	120,000
Miscellaneous west	---	---	---	---	---	---	---	---	---	---	---	---
of Rockies-----	---	---	---	---	---	---	---	---	---	---	---	---
Total	2	3,164,000	42	24,771,215	143	28,647,000	215	52,060,000	14	33,933,240	46	29,813,534

\*Fiscal years (July 1 to June 30) through June 30, 1924 and calendar years thereafter.

e \$115,150,715 loss and 467 deaths in State of Ohio

g \$245,000 in Oklahoma

h Incomplete

f \$894,000 in Oklahoma



# LOSS OF LIFE AND PROPERTY IN THE UNITED STATES FROM FLOODS

Table F 2--Continued

BY DISTRICTS AND YEARS\*, 1902-53

District	July 1-Dec. 31, 1924		1925		1926		1927		1928	
	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property
Great Lakes-----	9	\$ 1,000,000	---	---	---	\$ 19,200	48	\$ 15,750,000	---	---
North Atlantic-----	---	1,000,000	---	50,000	---	137,100	40	29,408,400	3	2,105,150
South Atlantic-----	---	562,510	---	2,999,175	---	---	---	1,000	5	8,382,538
East Gulf-----	---	---	2	615,025	---	37,170	8	254,700	---	2,428,500
Ohio Valley-----	---	8,000	---	33,000	2	5,523,577	94	15,639,620	---	10,279,150
Upper Mississippi-----	---	j 3,000,000	14	3,982,500	1	5,435,500	---	19,611,863	---	1,173,915
Lower Mississippi-----	---	---	---	115,000	---	42,000	100	133,898,468	---	7,820,000
1 Missouri-----	---	---	---	---	6	1,434,252	1	4,879,750	2	6,714,960
Arkansas-----	---	---	---	223,400	6	8,938,050	132	26,183,350	1	4,349,000
Red-----	---	---	---	---	1	154,900	---	100,908,300	---	153,000
i West Gulf-----	---	k 500,000	6	1,435,650	---	301,000	---	208,500	---	75,000
m Colorado-----	---	---	---	---	---	447,000	---	11,800	---	100,000
Pacific-----	---	66,700	14	468,285	---	---	---	902,671	---	1,032,351
Miscellaneous east of Rockies-----	---	---	---	---	---	---	---	---	---	---
Total	9	6,137,210	36	9,922,035	16	23,469,749	423	347,658,422	15	44,613,564

District	1929		1930		1931		1932		1933	
	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property
Great Lakes-----	---	171,000	---	36,165	---	1,200	---	1,200	---	14,130
North Atlantic-----	---	245,000	---	---	---	1,050,000	---	25,035	2	5,418,653
South Atlantic-----	8	n 10,195,680	---	---	---	31,000	---	190,925	---	19,100
East Gulf-----	5	8,746,306	---	465,800	---	174,100	---	615,335	---	443,706
Ohio Valley-----	34	h 17,049,500	---	7,041,805	---	1,200	---	288,256	5	7,725,025
Upper Mississippi-----	---	3,677,500	---	15,150	---	20,000	---	88,050	4	1,156,740
Lower Mississippi-----	4	9,979,601	---	529,955	---	---	---	1,840,510	---	6,932,770
Missouri-----	13	2,118,250	---	13,500	---	886,200	---	451,155	2	1,391,200
Arkansas-----	12	7,516,465	---	213,100	---	6,800	---	2,528,125	---	776,100
Red-----	1	100,450	14	3,615,800	---	19,475	---	515,809	---	37,800
West Gulf-----	---	8,124,250	---	924,350	---	2,000	11	3,521,695	---	1,160,300
Colorado-----	12	175,000	---	---	---	3,000	---	12,550	---	---
Pacific-----	---	---	---	---	---	560,000	---	216,590	20	11,603,950
Miscellaneous east of Rockies-----	---	---	---	2,500,000	---	---	---	---	---	---
Miscellaneous west of Rockies-----	---	---	---	494,500	---	55,000	---	---	---	---
Total	89	68,099,002	14	15,850,125	---	2,809,975	11	10,295,235	33	36,679,474

\*Fiscal years (July 1 to June 30) through June 30, 1924 and calendar years thereafter.

i Substituted for Texas district as used previously

j State of Illinois

k State of New Mexico

l Formerly included under Upper Mississippi

m Formerly included under Pacific

n Including damage from tropical disturbance during October

# LOSS OF LIFE AND PROPERTY IN THE UNITED STATES FROM FLOODS

Table F 2--Continued BY DISTRICTS AND YEARS\*, 1902-53

District	1934			1935			1936			1937			1938		
	Life	Property		Life	Property		Life	Property		Life	Property		Life	Property	
Great Lakes-----	---	\$-----		---	\$ 13,185,000		1	8,500		---	\$ 690,500		---	\$ 239,950	
North Atlantic-----	---	142,150		52	16,340,633		24	146,034,550		---	2,689,576		8	37,068,225	
South Atlantic-----	---	240,450		---	76,850		2	2,390,925		---	989,715		---	454,800	
East Gulf-----	---	12,525		---	719,675		---	1,240,495		---	357,580		---	1,654,877	
Ohio-----	2	928,125		5	8,535,700		82	122,295,790		65	413,936,876		8	4,480,780	
Upper Mississippi-----	12	1,022,850		---	1,505,745		---	313,400		3	1,127,205		2	3,659,300	
Lower Mississippi-----	---	---		17	6,631,548		---	54,750		72	6,657,557		---	1,000	
Missouri-----	6	1,905,860		125	38,959,091		---	109,400		2	1,367,960		71	4,333,135	
Arkansas-----	---	17,750		4	8,344,515		6	816,950		---	1,557,950		---	2,202,606	
Red-----	22	640,250		8	2,751,695		---	16,400		---	24,850		---	754,830	
West Gulf-----	---	422,400		20	29,522,022		24	8,376,490		---	1,830,100		6	6,003,159	
Colorado-----	1	21,500		---	---		---	---		---	264,385		---	256,733	
Pacific-----	45	5,007,500		5	557,150		3	891,610		---	9,245,275		85	39,990,250	
Total	88	10,361,360		236	127,129,624		142	282,549,260		142	440,739,529		180	101,099,645	

District	1939			1940			1941			1942			1943		
	Life	Property		Life	Property		Life	Property		Life	Property		Life	Property	
Great Lakes-----	---	11,100		2	---		---	---		---	153,075		1	9,564,253	
North Atlantic-----	2	56,275		4	2,519,075		---	---		35	22,320,900		4	818	
South Atlantic-----	---	454,340		12	5,033,925		---	88,850		---	607,960		---	152,274	
East Gulf-----	1	6,679,900		---	5,496,483		---	23,850		2	155,350		---	773,390	
Ohio-----	80	3,772,791		28	8,077,275		---	1,122,150		16	16,546,182		44	31,415,643	
Upper Mississippi-----	---	227,750		---	199,315		---	3,018,180		1	5,592,056		16	42,097,371	
Lower Mississippi-----	---	1,448,100		---	---		---	---		---	475,000		---	829,200	
Missouri-----	---	609,375		5	1,758,850		2	12,018,755		1	22,510,940		13	62,630,405	
Arkansas-----	---	179,350		2	1,332,000		9	13,346,100		---	6,576,405		26	41,850,342	
Red-----	---	22,200		---	11,800		---	1,855,300		---	2,204,950		---	43,650	
West Gulf-----	---	359,675		7	7,621,750		34	5,457,975		2	12,489,050		---	2,588,700	
Colorado-----	---	12,950		---	180,000		2	1,061,500		---	2,850		---	310,000	
Pacific-----	---	---		---	8,236,010		---	1,532,030		11	8,871,480		3	7,477,099	
Total	83	13,833,806		60	40,466,483		47	39,524,690		68	98,506,198		107	199,733,145	

\*Fiscal years (July 1 to June 30) through June 30, 1924 and calendar years thereafter.



# LOSS OF LIFE AND PROPERTY IN THE UNITED STATES FROM FLOODS

Table F 2--Continued

BY DISTRICTS AND YEARS\*, 1902-53

District	1944		1945		1946		1947		1948	
	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property
Great Lakes-----	---	\$ 129,900	---	\$ 118,800	---	\$ 250,600	1	\$ 5,761,400	4	\$ 20,269,800
North Atlantic-----	---	-----	3	5,728,700	14	8,500,400	---	198,000	4	12,466,800
South Atlantic-----	---	1,926,500	3	1,006,800	---	172,300	---	944,200	1	1,372,200
East Gulf-----	---	2,660,200	---	267,500	---	2,962,800	2	654,100	---	3,121,800
Ohio-----	---	806,000	27	52,887,100	---	10,913,500	5	7,812,400	16	16,871,100
Upper Mississippi-----	7	27,030,800	---	9,288,400	4	8,642,300	27	87,936,900	---	2,904,800
Lower Mississippi-----	---	1,350,000	---	3,601,300	---	4,407,000	1	2,555,300	---	5,390,300
Missouri-----	13	44,615,700	4	34,402,500	---	8,305,200	18	163,175,800	1	31,489,300
Arkansas-----	10	11,171,100	20	15,067,700	---	1,791,500	1	1,423,500	14	18,721,000
Red-----	---	1,675,900	6	22,209,200	---	1,434,300	---	1,445,500	---	220,000
West Gulf-----	3	8,938,300	4	10,986,600	10	15,966,800	---	330,000	1	4,603,900
Colorado-----	---	575,000	10	181,500	---	---	---	3,000	---	1,100
Pacific-----	---	-----	14	9,530,400	---	7,367,000	---	88,000	37	111,825,600
Great Basin-----	---	-----	---	520,000	---	99,800	---	-----	---	-----
Total	33	101,079,400	91	165,797,500	28	70,813,500	55	272,328,100	82	229,960,400

District	1949		1950		1951		1952		1953	
	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property
Great Lakes-----	---	1,619,500	9	33,541,600	---	130,800	---	2,349,600	1	2,653,800
North Atlantic-----	---	-----	2	7,149,300	1	916,300	5	1,221,700	1	10,637,000
South Atlantic-----	14	9,563,900	---	1,203,500	---	9,000	---	236,500	---	108,800
East Gulf-----	---	1,746,600	---	1,434,600	---	4,309,800	---	347,000	2	2,443,800
Ohio-----	7	4,754,500	50	25,195,200	1	4,889,300	14	4,939,900	5	777,700
Upper Mississippi-----	---	405,700	2	11,059,800	6	71,798,700	7	22,439,000	2	5,602,200
Lower Mississippi-----	---	10,020,200	6	10,071,200	---	5,995,500	---	444,500	12	7,857,000
Missouri-----	6	33,503,000	18	35,089,800	31	889,872,400	8	181,334,900	14	44,254,900
Arkansas-----	---	6,696,300	---	8,294,000	10	44,331,100	---	5,400	2	2,020,300
Red-----	2	364,800	1	1,105,000	---	2,101,400	---	835,600	---	2,060,500
West Gulf-----	18	22,462,000	---	416,700	---	238,500	10	9,584,500	1	34,848,500
Colorado-----	---	155,400	---	-----	---	889,200	---	75,900	---	7,500
Pacific-----	1	2,640,000	5	37,361,800	---	3,259,500	10	20,251,400	---	8,931,400
Great Basin-----	---	-----	---	4,126,600	---	-----	---	9,998,500	---	-----
Total	48	93,931,900	93	176,049,100	51	1,028,741,500	54	254,064,400	40	122,203,400

\*Fiscal years (July 1 to June 30) through June 30, 1924 and calendar years thereafter.

# LOSS OF LIFE AND PROPERTY IN THE UNITED STATES FROM FLOODS, 1924-1953

BY MONTHS AND YEARS

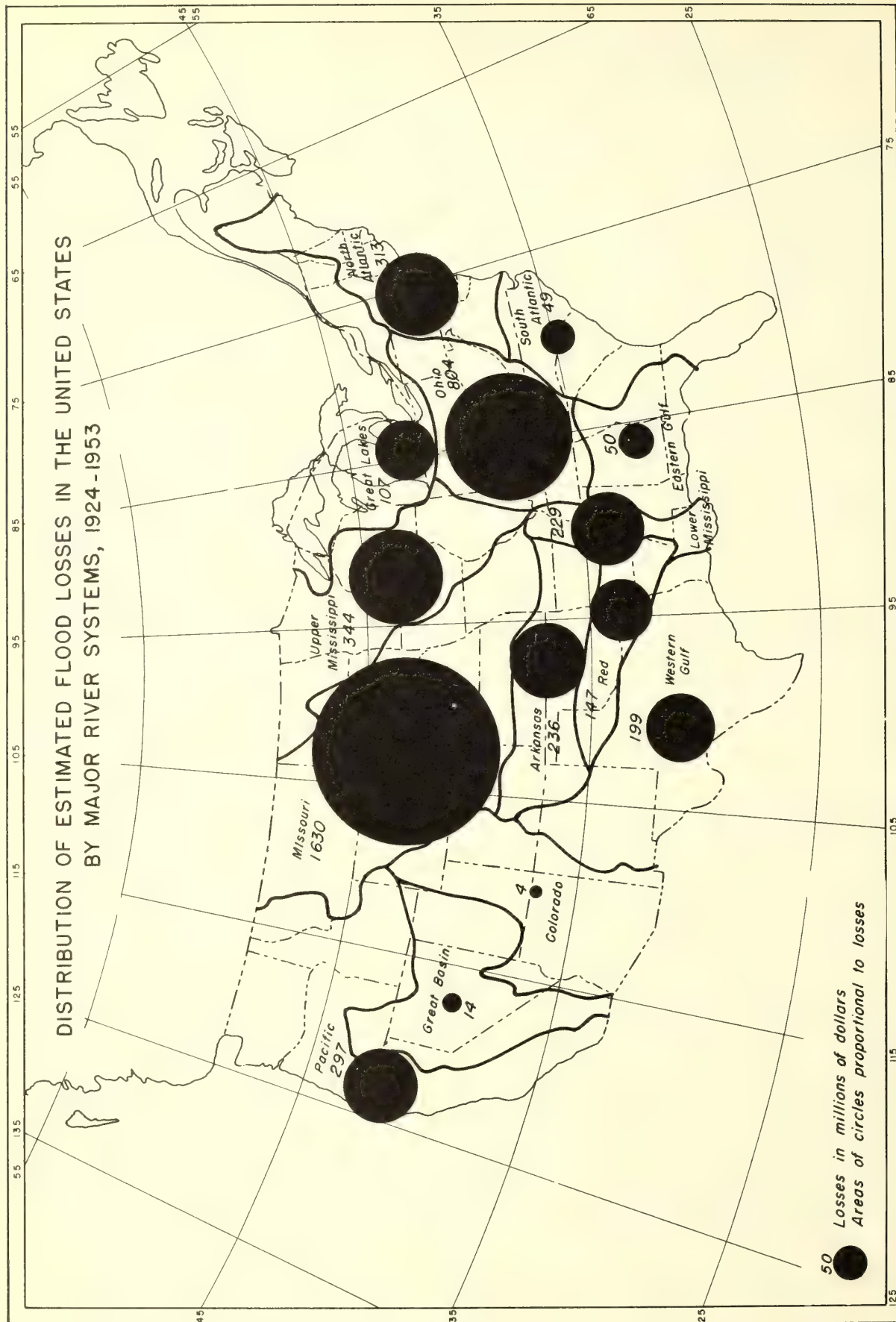
Table F 3

Year	January		February		March		April		May		June		July		August		September		October		November		December		Total	
	Property	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property	Life
1924	-	0	41,020	0	7,005,115	5	211,900	0	1,035,000	0	2,549,500	11	80,000	0	4,500,000	9	-	0	1,482,510	0	66,700	0	8,000	0	16,979,745	27
1925	3,614,200	2	141,150	0	72,500	0	-	0	65,000	6	3,980,000	14	140,035	0	275,000	0	1,170,500	14	380,000	0	83,650	0	-	0	9,922,035	36
1926	19,370	0	800,000	0	76,300	0	293,450	0	7,565,000	95	1,125,400	1	55,200	0	7,000	0	7,729,402	6	12,699,150	6	135,100	0	1,854,177	3	23,469,749	16
1927	2,625,500	0	1,865,450	0	487,500	0	2,709,150	0	1,055,000	0	12,295,400	0	13,339,450	0	3,465,400	0	4,047,209	5	1,627,000	0	3,563,600	88	437,000	0	347,658,422	423
1928	12,271	0	1,865,450	0	758,100	0	1,558,100	0	1,055,000	0	12,295,400	0	13,339,450	0	3,465,400	0	4,047,209	5	1,627,000	0	3,563,600	88	437,000	0	347,658,422	423
1929	121,600	0	2,963,775	0	21,947,171	47	1,936,600	0	15,668,160	5	10,268,241	5	4,958,750	32	130,375	0	92,000	0	9,378,830	0	556,850	0	76,650	0	68,099,002	85
1930	7,110,455	0	6,665	0	145,700	0	1,936,600	0	5,021,050	14	3,042,455	0	244,000	0	250,500	0	-	0	29,000	0	-	0	-	0	15,850,125	14
1931	-	0	30,000	0	572,000	0	-	0	8,000	0	13,000	0	1,215,000	0	201,000	0	2,000	0	1,300	0	744,900	0	22,775	0	2,809,975	0
1932	1,206,620	0	86,346	0	2,007,890	1	2,709,150	0	1,562,135	0	1,244,850	0	1,626,850	0	763,200	0	2,665,600	11	335,165	0	3,200	0	359,935	0	10,295,235	11
1933	5,081,115	0	1,250	0	2,176,548	0	2,698,480	0	10,785,210	4	2,650,480	4	1,116,800	0	6,516,078	4	489,200	0	10,000	0	-	0	10,000,000	16	36,679,474	33
1934	297,435	40	1,250	0	2,176,548	0	2,698,480	0	16,903,722	40	62,702,292	122	29,370,340	52	321,500	3	7,351,157	0	27,650	0	1,287,470	0	154,500	0	10,361,360	88
1935	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	2,691,000	0	61,530	0	2,517,100	8	127,129,624	236
1936	341,150	0	2,107,185	6	145,935,550	24	124,742,760	82	1,117,750	6	123,950	0	2,427,690	20	205,000	0	5,045,900	4	378,075	0	118,450	0	5,800	0	282,549,260	142
1937	411,481,015	65	7,690,647	75	61,885	0	4,523,717	0	2,626,560	0	5,429,175	0	1,235,300	20	760,000	0	140,200	0	256,280	0	97,850	0	7,546,900	0	440,739,529	142
1938	260,250	0	3,711,704	2	27,819,128	86	7,008,372	0	12,402,340	0	3,624,256	58	10,372,865	9	232,375	8	39,640,905	17	2,550	0	5,000	0	19,900	0	101,059,645	180
1939	3,000	0	1,657,280	4	737,675	0	1,981,701	0	36,800	0	4,271,100	0	1,725,000	78	3,408,300	0	12,950	0	-	0	-	0	-	0	13,833,806	83
1940	57,500	0	7,245,704	0	1,047,906	2	2,184,825	0	437,643	0	2,790,150	12	5,313,755	0	18,853,000	40	2,135,000	6	88,000	0	95,300	0	217,700	0	40,466,483	60
1941	3,100	0	515,175	0	820,450	2	1,970,050	4	3,080,570	7	12,717,915	12	313,850	0	22,000	0	5,247,350	15	10,445,600	7	3,361,400	0	25,350	0	39,524,690	47
1942	120,500	0	1,900,680	1	326,785	6	18,369,455	21	14,836,905	31	25,582,940	17	13,063,935	17	267,000	0	3,235,580	0	3,677,350	0	-	0	15,113,768	10	99,793,195	107
1943	3,578,691	4	69,150	5	7,182,700	5	10,161,367	8	5,130,478,142	57	41,770,936	0	2,870,050	3	3,621,271	25	-	0	108,000	0	818	0	1,182,400	0	101,079,430	33
1944	145,500	0	5,881,700	0	33,501,800	14	54,054,400	36	23,530,300	0	28,865,600	8	8,280,000	3	2,941,700	13	1,058,600	3	1,424,000	3	-	0	6,413,300	11	165,796,900	91
1945	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	-	-	-
1946	13,384,700	0	4,015,400	0	630,900	0	2,000	0	12,586,500	12	20,342,600	3	1,636,100	1	1,148,000	0	7,346,100	9	1,964,900	0	1,314,700	0	6,441,600	0	70,813,500	28
1947	486,000	3	90,100	0	1,478,100	0	56,026,700	2	18,032,200	1	193,133,600	48	651,600	1	1,430,900	0	455,200	0	248,000	0	5,000	0	304,500	0	272,328,100	55
1948	6,478,600	6	11,429,300	3	11,896,200	1	28,667,400	3	107,244,000	35	22,160,200	15	17,550,000	2	1,143,900	0	589,800	0	3,553,500	0	3,553,500	0	13,247,600	4	229,960,400	82
1949	4,519,000	3	6,924,500	7	3,451,300	7	14,667,600	6	18,155,700	21	22,346,400	34	13,222,800	3	1,698,160	0	516,200	4	1,550,000	2	578,400	0	16,500	0	176,639,100	93
1950	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	-	-	-
1951	884,000	0	5,823,100	2	7,264,700	0	18,287,100	2	15,165,600	6	5,382,500	8	972,458,000	25	2,509,200	7	620,800	0	-	0	-	0	346,500	0	1,028,741,500	51
1952	9,139,300	14	926,100	1	1,909,300	9	199,127,000	10	6,438,100	3	22,774,700	2	3,857,700	9	296,100	0	9,375,500	6	42,000	0	30,000	0	190,600	0	254,064,400	54
1953	8,574,700	1	368,000	0	10,674,900	2	-	0	41,655,900	5	53,572,200	29	3,873,000	1	1,925,600	2	897,000	0	-	0	300,000	0	330,100	0	122,203,400	40
Total	489,651,181	157	71,225,726	107	310,768,278	222	883,972,558	450	541,801,887	358	623,052,491	422	1,123,268,461	269	67,804,807	125	106,664,244	100	56,409,140	23	67,698,838	98	102,972,055	61	4,445,289,666	2,392
Average	16,321,706	5	2,374,191	4	10,358,843	7	29,465,752	15	18,060,063	12	20,768,416	14	37,442,282	9	2,260,160	4	3,555,475	3	1,880,305	1	2,256,628	3	3,432,402	2	148,176,322	80

\*Unknown



# DISTRIBUTION OF ESTIMATED FLOOD LOSSES IN THE UNITED STATES BY MAJOR RIVER SYSTEMS, 1924-1953



50 Losses in millions of dollars  
Areas of circles proportional to losses

LOSSES IN INDIVIDUAL GREAT FLOODS IN THE UNITED STATES SINCE JULY 1902

Table F 4

Date	Locality	Lives #	Property
May-June 1903-----	Kansas, lower Missouri, and upper----- Mississippi Rivers-----	100	\$ 40,000,000
July 1908-----	Missouri River-----	---	9,339,000
	Upper Mississippi River-----	---	5,600,000
	Red River-----	---	16,200,000
July 1909-----	Missouri River east of Kansas City----	---	5,500,000
March 1912-----	Lower Mississippi River-----	---	70,000,000
March 1913-----	Ohio River and tributaries-----	467	147,000,000
	Mississippi River-----	---	7,000,000
December 1913-----	Texas rivers-----	177	9,000,000
June 1915-----	Kansas River-----	---	5,950,000
August 1916-----	Rivers of the Carolinas-----	---	21,700,000
June 1921-----	Arkansas River in State of Colorado---	120	25,000,000
September 1921----	Texas rivers-----	215	19,000,000
April-May, 1922*---	Upper Mississippi River-----	---	4,700,000
	Ohio Valley-----	---	4,000,000
	Lower Mississippi River-----	---	7,500,000
October 1923-----	Lower Arkansas, including the State--- of Oklahoma-----	---	15,000,000
March 1924-----	Potomac River-----	---	6,000,000
Spring of 1927----	Mississippi Valley-----	313	284,117,631
August 1927-----	Arkansas River and tributaries-----	---	3,440,000
November 1927-----	New England rivers-----	88	45,577,700
June 1928-----	Ohio Valley-----	---	7,535,500
August 1928-----	South Atlantic drainage-----	---	4,400,000
September 1928----	South Atlantic drainage-----	---	4,000,000
March-June 1929---	East Gulf drainage-----	---	8,000,000
	Ohio Valley-----	---	16,500,000
	Missouri Valley-----	---	2,000,000
	Upper Mississippi Valley-----	---	3,600,000
	Lower Mississippi Valley-----	---	10,000,000
	Arkansas-White Valley-----	---	2,700,000
	Rivers in Texas-----	---	8,000,000
July 1929-----	Rivers in central Kansas-----	---	4,000,000
October 1929-----	Rivers in Southeastern States-----	---	** 9,000,000
January 1930-----	White-Wabash Rivers-----	---	7,000,000
May 1930-----	Red River and tributaries-----	---	3,000,000
Sept.-Oct. 1932----	Lower Rio Grande-----	---	2,500,000
March 1933-----	Ohio River-----	---	2,000,000
December 1933-----	Columbia River and tributaries-----	---	10,000,000
May 1935-----	Rivers in eastern Colorado-----	---	6,000,000
May-June 1935-----	Republican and Kansas Rivers-----	110	18,000,000
	Lower Missouri River-----	---	10,000,000
July 1935-----	Upper Susquehanna tributaries-----	52	26,000,000
December 1935-----	Houston, Texas, area-----	---	2,500,000
March-April 1936---	Rivers in Eastern United States-----	107	270,000,000
July 1936-----	Rivers in central Texas-----	---	2,000,000
September 1936----	Rivers in central and northern Texas--	---	5,000,000
Jan.-Feb. 1937----	Ohio and lower Mississippi River----- basins-----	137	417,685,000
December 1937-----	Sacramento Valley-----	---	7,100,000
March 1938-----	Streams in southern California-----	79	24,500,000
September 1938-----	Rivers in New England-----	---	37,000,000
July 1939-----	Licking and Kentucky Rivers-----	78	1,715,000
Feb.-Mar. 1940----	Sacramento Valley-----	---	6,700,000
August 1940-----	Rivers in southern Virginia, the Caro- linas, and eastern Tennessee-----	40	12,000,000



## LOSSES IN INDIVIDUAL GREAT FLOODS IN THE UNITED STATES SINCE JULY 1902-Cont.

Table F 4--Continued

Date	Locality	Lives #	Property
Oct.-Nov. 1941----	Arkansas River Basin-----	---	8,500,000
April-June 1942---	Upper Mississippi, Missouri, Arkansas, Red, and Trinity River Basins-----	---	44,350,000
May 1942-----	Delaware & Susquehanna River Basins---	33	13,000,000
July 1942-----	Upper Allegheny River and Sennemahoning Creek Basins-----	15	10,000,000
Nov.-Dec. 1942----	Willamette River-----	10	6,900,000
Dec. 1942-Jan. 1943	Ohio River-----	---	10,540,000
Apr.-June 1943----	Maumee, Wabash, upper Mississippi, Missouri, White, and Arkansas River Basins-----	60	172,500,000
August 1943-----	Little Kanawha-----	23	1,300,000
Apr.-June 1944----	Upper Mississippi, Missouri, Arkansas, Red, lower Mississippi Basins and east Texas Streams-----	17	82,000,000
Feb.-Mar. 1945----	Ohio River-----	18	30,000,000
Feb.-Apr. 1945----	Trinity and Sabine Rivers-----	---	9,000,000
Mar.-July 1945----	Lower Mississippi River-----	---	9,500,000
July 1945-----	Lake Section of Rensselaer County, N.Y.---	---	3,500,000
December 1945----	Willamette River-----	9	6,000,000
January 1946-----	Cumberland River-----	---	3,925,000
	Tennessee River and tributaries-----	---	4,500,000
May-June 1946----	Trinity River-----	---	4,150,000
September 1946----	San Antonio and Nueces Rivers-----	9	6,050,000
December 1946----	Willamette River-----	---	5,525,000
April 1947-----	Allegheny River-----	---	4,319,000
May-July 1947----	Rivers in Middle West in the lower Missouri and middle Mississippi River Basins-----	29	235,000,000
June 1947-----	East Creek at Rutland, Vt.-----	---	2,000,000
March 1948-----	Susquehanna River and tributaries-----	---	4,300,000
Apr.-May 1948----	Red River of North and tributaries-----	---	18,700,000
May-June 1948----	Columbia Basin-----	37	112,000,000
June-July 1948----	Arkansas River and minor tributaries-----	---	14,500,000
December 1948----	Housatonic River-----	---	4,200,000
April 1949-----	Rio Grande-----	---	3,300,000
May 1949-----	Trinity River-----	10	14,000,000
June 1949-----	Shenandoah and Potomac Rivers-----	11	8,850,000
Apr.-May 1950----	Red River of North-----	9	° 33,000,000
June 1950-----	Central West Virginia-----	31	4,020,000
Nov.-Dec. 1950----	Central Valleys of California and Western Nevada-----	---	° 23,000,000
February 1951----	Western Washington-----	---	2,688,300
Mar.-Apr. 1951----	Alabama-Georgia-----	---	3,292,200
April 1951-----	Upper Mississippi Basin-----	---	18,622,200
June-July 1951----	Kansas-Missouri-----	25	935,224,000
Jan.-Feb. 1952----	Ohio River-----	1	1,897,500
April 1952-----	Red River of the North-Upper Mississippi-Missouri River Basins-----	11	198,000,000
May 1952-----	Great Basin-----	---	8,372,800
September 1952----	West Gulf of Mexico Drainage-----	6	7,761,800
January 1953-----	Northern California, Oregon, and Washington-----	---	5,970,700
March 1953-----	New England States-----	1	10,000,000
Apr.-May 1953----	Louisiana-Texas-----	12	38,959,000
June 1953-----	Northwestern Iowa-----	14	32,950,300

\* Loss of life carried only where considerable.

\* No lives lost in Mississippi Valley floods of 1922.

\*\* Partly storm damage caused by tropical disturbance.

° Preliminary.

# GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

## YEAR 1953

The maximum flood stages recorded during 1953 are shown in the chart below in percent of range between flood stage and the maximum stage of record.

The floods in Louisiana and Texas during April and May were the most damaging and widespread ones to be reported in 1953. They were unusual in that they struck the same area twice within a period of two to three weeks. The first developed from heavy rainfall on April 28 and 29, ranging from an average of 2.5 to 10 inches. The second rise was due to heavy rains which began on May 11 and continued for 7 to 9 days. The rain was exceptionally heavy over the Lower Sabine River and other southwestern Louisiana streams on May 18, ranging from 8 to 12 inches on that day. The rainfall during the 9-day period ranged from 8.8 inches at Gladewater, Tex., to 19.8 inches at Glenmora, La. Near-record to record floods occurred on the Calcasieu and Lower Sabine Rivers. Flood damages at Lake Charles, La., alone were estimated at around 10 million dollars, whereas the flood damage for the entire area was several times that amount.

Major floods occurred in the coastal streams of northern California, Oregon, and Washington during January. The flood in the Klamath River was higher than the floods of 1945 and 1950, and about equal to the extreme flood of 1927. The flooding in Oregon was severe west of the Cascades.

Flooding during February was scattered. The greatest damage was reported in the Pearl River Basin in Mississippi. Three lives were lost in the Ohio Basin in the Greenbrier and East Rivers of West Virginia. The highest discharge in 20 years was reported near Iowa City, Iowa, from the Rapid Creek Watershed.

The most important floods during March occurred in the New England States. The damages in Maine alone were estimated at around 10 million dollars. The floods in the Merrimack River Basin in Massachusetts and New Hampshire were severe and caused considerable damage. In the Pemigewasset River at Plymouth, N. H., the stage was the highest since September 1938.

The second most damaging flood during the year occurred in northwestern Iowa, in the Big Sioux, Floyd, and Little Sioux Rivers in June. It was a flash-type flood which began during the early morning hours of June 8 in the vicinities of Hawarden, Le Mars, and Merrill, Iowa. It resulted

from torrential rains which accompanied thunderstorms during the afternoon and evening of the 7th. The Floyd River rose 12.3 feet over night at Merrill, Iowa, and produced the most devastating flood that ever occurred at Sioux City, Iowa. The flood struck the City like a tidal wave, with deep surges of water moving through stock yards and packing house districts, spreading over the railroad yards and into the lower sections of the main business district. Severe flash floods on Indian Creek, Six-Mill Creek, and Dry Creek caused an unusually rapid rise on the Big Sioux River. It is reported that it rose 13.4 feet in less than 22 hours. The flood losses in the Floyd River Basin alone were estimated at 25.5 million dollars with another 4 million dollars on the Big and Little Sioux Rivers. Fourteen lives were lost in the Floyd River flood.

Overflows during July were mostly of a local nature and confined largely to tributaries and creeks. The heaviest damages occurred along the upper Minnesota River which continued in flood from June 28 to July 11 and was mostly to growing crops along the river.

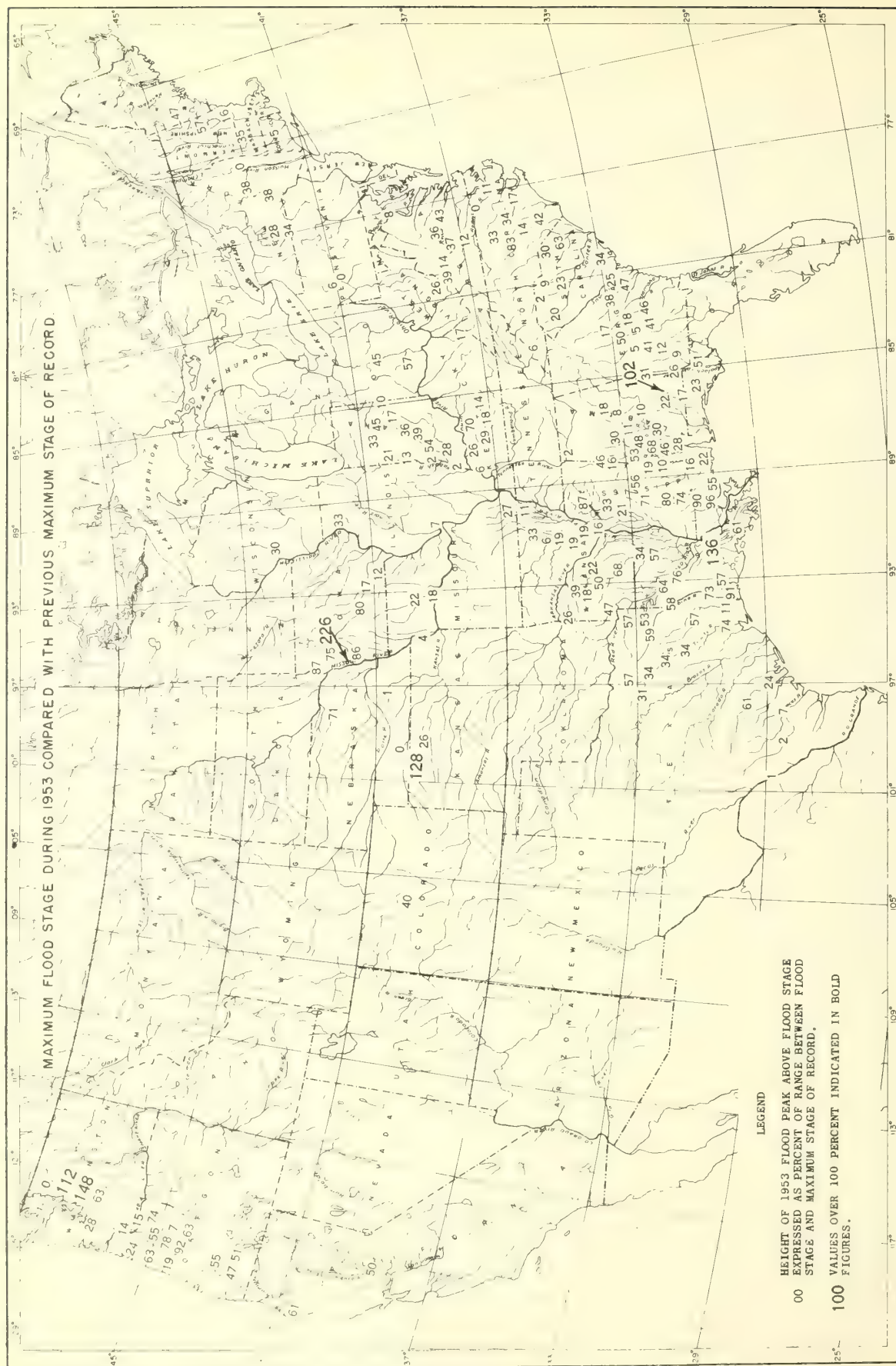
There were no major floods during August. Flash floods were reported at scattered locations throughout the country. The Bogue Chitto River reached the highest stage for any August at Franklinton, La. The local flood in the Belfield, N. Dak., area was the worst since 1906.

Streams during September and October remained at low levels throughout most of the country. As a result of widespread drought conditions, record-low stages were reached at several points. The Mississippi River receded to its lowest level at Memphis, Tenn., in more than 80 years of record. In contrast to this, the heavy rains over the Florida Peninsula during August and September caused high stages on several streams during September with record flooding on the St. Johns River.

The only flooding of any consequence during November occurred in northwestern California and in southwestern Oregon. The Smith River at Crescent City, Calif., reached a near-record stage.

Flooding during December was light to moderate and confined mostly to the Central Gulf of Mexico Drainage and Puget Sound Basin. There was some severe local flooding on small streams in south-central Alabama.





# RADIOSONDE DATA

Average annual values

Table 20

YEAR 1953

ALBUQUERQUE, N. MEX. ( 838 MB.)					ATLANTA, GA. ( 982 MB.)					BISMARCK, N. DAK. ( 954 MB.)					BOISE, IDAHO ( 916 MB.)					BROWNSVILLE, TEX. (1014 MB.)					BUFFALO, N. Y. ( 989 MB.)					BURRWOOD, LA. (1017 MB.)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Standard pressure surface (mb.)	Number of observations				Dynamic height				Temperature				Relative humidity				Number of observations				Dynamic height				Temperature				Relative humidity				Number of observations				Dynamic height				Temperature				Relative humidity																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	363	1,619	14.9	36	364	309	15.8	73	364	505	6.7	73	365	868	12.1	57	363	7	22.4	79	364	221	9.1	76	364	3	21.1	84	364	145	21.1	76	364	592	18.9	68	364	1,051	16.6	60	364	1,536	14.3	53	364	2,046	11.8	48	364	2,590	9.2		364	3,153	6.2		360	3,760	2.8		360	4,400	- 1.0		358	5,090	- 5.4		357	5,830	-10.2		354	6,643	-15.8		352	7,511	-22.0		351	8,468	-29.1		349	9,561	-37.3		348	10,794	-46.4		342	12,241	-55.9		338	13,903	-60.8		334	15,029	-63.7		329	16,349	-65.8		324	17,746	-64.7		319	19,515	-61.4		314	20,653	-59.3		309	22,080	-56.8		304	23,517	-54.9		299	25,099	-52.9		294	26,734	-50.0		289	28,422	-48.0		284	30,817	-45.1		279	33,252	-42.2		274	35,737	-39.3		269	38,262	-36.4		264	40,836	-33.5		259	43,451	-30.6		254	46,066	-27.7		249	48,781	-24.8		244	51,496	-21.9		239	54,211	-19.0		234	56,926	-16.1		229	59,641	-13.2		224	62,356	-10.3		219	65,071	-7.4		214	67,786	-4.5		209	70,501	-1.6		204	73,216	1.3		199	75,931	4.2		194	78,546	7.1		189	81,171	10.0		184	83,796	12.9		179	86,421	15.8		174	89,046	18.7		169	91,671	21.6		164	94,296	24.5		159	96,921	27.4		154	99,546	30.3		149	102,171	33.2		144	104,796	36.1		139	107,421	39.0		134	110,046	41.9		129	112,671	44.8		124	115,296	47.7		119	117,921	50.6		114	120,546	53.5		109	123,171	56.4		104	125,796	59.3		99	128,421	62.2		94	131,046	65.1		89	133,671	68.0		84	136,296	70.9		79	138,921	73.8		74	141,546	76.7		69	144,171	79.6		64	146,796	82.5		59	149,421	85.4		54	152,046	88.3		49	154,671	91.2		44	157,296	94.1		39	160,001	97.0		34	162,626	99.9		29	165,251	102.8		24	167,876	105.7		19	170,501	108.6		14	173,126	111.5		9	175,751	114.4		4	178,376	117.3			180,001	120.2			182,626	123.1			185,251	126.0			187,876	128.9			190,501	131.8			193,126	134.7			195,751	137.6			198,376	140.5			201,001	143.4			203,626	146.3			206,251	149.2			208,876	152.1			211,501	155.0			214,126	157.9			216,751	160.8			219,376	163.7			222,001	166.6			224,626	169.5			227,251	172.4			230,001	175.3			232,626	178.2			235,251	181.1			237,876	184.0			240,501	186.9			243,126	189.8			245,751	192.7			248,376	195.6			251,001	198.5			253,626	201.4			256,251	204.3			258,876	207.2			261,501	210.1			264,126	213.0			266,751	215.9			269,376	218.8			272,001	221.7			274,626	224.6			277,251	227.5			280,001	230.4			282,626	233.3			285,251	236.2			287,876	239.1			290,501	242.0			293,126	244.9			295,751	247.8			298,376	250.7			301,001	253.6			303,626	256.5			306,251	259.4			308,876	262.3			311,501	265.2			314,126	268.1			316,751	271.0			319,376	273.9			322,001	276.8			324,626	279.7			327,251	282.6			330,001	285.5			332,626	288.4			335,251	291.3			337,876	294.2			340,501	297.1			343,126	300.0			345,751	302.9			348,376	305.8			351,001	308.7			353,626	311.6			356,251	314.5			358,876	317.4			361,501	320.3			364,126	323.2			366,751	326.1			369,376	329.0			372,001	331.9			374,626	334.8			377,251	337.7			380,001	340.6			382,626	343.5			385,251	346.4			387,876	349.3			390,501	352.2			393,126	355.1			395,751	358.0			398,376	360.9			401,001	363.8			403,626	366.7			406,251	369.6			408,876	372.5			411,501	375.4			414,126	378.3			416,751	381.2			419,376	384.1			422,001	387.0			424,626	389.9			427,251	392.8			430,001	395.7			432,626	398.6			435,251	401.5			437,876	404.4			440,501	407.3			443,126	410.2			445,751	413.1			448,376	416.0			451,001	418.9			453,626	421.8			456,251	424.7			458,876	427.6			461,501	430.5			464,126	433.4			466,751	436.3			469,376	439.2			472,001	442.1			474,626	445.0			477,251	447.9			480,001	450.8			482,626	453.7			485,251	456.6			487,876	459.5			490,501	462.4			493,126	465.3			495,751	468.2			498,376	471.1			501,001	474.0			503,626	476.9			506,251	479.8			508,876	482.7			511,501	485.6			514,126	488.5			516,751	491.4			519,376	494.3			522,001	497.2			524,626	500.1			527,251	503.0			530,001	505.9			532,626	508.8			535,251	511.7			537,876	514.6			540,501	517.5			543,126	520.4			545,751	523.3			548,376	526.2			551,001	529.1			553,626	532.0			556,251	534.9			558,876	537.8			561,501	540.7			564,126	543.6			566,751	546.5			569,376	549.4			572,001	552.3			574,626	555.2			577,251	558.1			580,001	561.0			582,626	563.9			585,251	566.8			587,876	569.7			590,501	572.6			593,126	575.5			595,751	578.4			598,376	581.3			601,001	584.2			603,626	587.1			606,251	590.0			608,876	592.9			611,501	595.8			614,126	598.7			616,751	601.6			619,376	604.5			622,001	607.4			624,626	610.3			627,251	613.2			630,001	616.1			632,626	619.0			635,251	621.9			637,876	624.8			640,501	627.7			643,126	631.6			645,751	634.5			648,376	637.4			651,001	640.3			653,626	643.2			656,251	646.1			658,876	649.0			661,501	651.9			664,126	654.8			666,751	657.7			669,376	660.6			672,001	663.5			674,626	666.4			677,251	669.3			680,001	671.2			682,626	674.1			685,251	677.0			687,876	680.0			690,501	682.9			693,126	685.8			695,751	688.7			698,376	691.6			701,001	694.5			703,626	697.4			706,251	700.3			708,876	703.2			711,501	706.1			714,126	709.0			716,751	711.9			719,376	714.8			722,001	717.7			724,626	720.6			727,251	723.5			730,001	726.4			732,626	729.3			735,251	732.2			737,876	735.1			740,501	738.0			743,126	741.0			745,751	743.9			748,376	745.8			751,001	748.7			753,626	751.6			756,251	754.5			758,876	757.4			761,501	760.3			764,126	763.2			766,751	766.1			769,376	769.0			772,001	771.9			774,626	774.8			777,251	777.7			780,001	780.6			782,626	783.6			785,251	786.5			787,876	789.4			790,501	792.3			793,126	795.2			795,751	798.1			798,376	801.0			801,001	803.9			803,626	806.8			806,251	809.7			808,876	812.6			811,501	815.5			814,126	818.4			816,751	821.3			819,376	824.2			822,001	827.1			824,626	830.0			827,251	832.9			830,001	835.8			832,626	838.7			835,251	841.6			837,876	844.5			840,501	847.4			843,126	850.3			845,751	853.2			848,376	856.1			851,001	859.0			853,626	861.9			856,251	864.8			85



# RADIOSONDE DATA

Average annual values

Table 20—Continued

YEAR 1953

Standard pressure surface (mb.)	LAKE CHARLES, LA. (1016 MB.)				LANDER, WYO. (828 MB.)				LAS VEGAS, NEV. (936 MB.)				LITTLE ROCK, ARK. (1007 MB.)				MAZATLAN, MEXICO (1010 MB.)				MEDFORD, ORE. (971 MB.)				MERIDA, MEXICO (1012 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	365	5	19.4	81	364	1,696	6.3	50	364	660	20.3	22	365	79	16.4	69	352	14	25.5	75	365	401	13.3	68	355	27	25.9	75
1,000---	365	141	20.2	71	364	100			364	84			365	135	17.6	60	352	98	24.7	72	365	147			355	130	25.5	75
950----	365	587	18.3	66	364	542			364	535			365	577	17.0	54	352	556	23.8	52	365	586	13.7	59	355	582	23.2	73
900-----	365	1,046	16.0	62	364	999			364	1,002	21.0		365	1,034	14.3	56	352	1,020	22.0	47	365	1,035	11.5	57	355	1,051	20.5	72
850-----	365	1,530	13.8	56	364	1,476			364	1,492	17.2		364	1,514	11.8	53	352	1,514	19.1		365	1,510	8.2	59	355	1,543	17.5	72
800-----	365	2,040	11.6	50	364	1,981	9.5	41	364	2,005	13.1		364	2,020	9.4	48	352	2,032	16.0		365	2,008	4.9	59	355	2,059	14.7	66
750-----	365	2,584	8.9		364	2,517	5.8	42	364	2,547	8.8		363	2,558	6.7	45	352	2,585	12.7		365	2,536	1.8	57	355	2,605	12.1	61
700-----	365	3,145	5.7		364	3,073	1.8	45	364	3,109	4.3	31	363	3,116	3.6	43	347	3,153	9.1		365	3,084	-1.3	50	353	3,179	9.3	
650-----	363	3,752	2.2		364	3,712	-2.7	48	364	3,711	-2.3		360	3,719	-1.1		345	3,765	5.0		364	3,677	-4.8		343	3,793	6.0	
600-----	361	4,390	-1.7		364	4,295	-7.2	48	364	4,343	-4.5		359	4,352	-3.7		342	4,412	-7.7		364	4,296	-8.6		333	4,441	2.2	
550-----	360	5,079	-6.1		364	4,969	-11.9	47	361	5,023	-9.1		359	5,036	-7.9		340	5,104	-3.8		362	4,969	-12.8		326	5,139	-2.0	
500-----	355	5,817	-10.9		363	5,690	-16.8	43	360	5,754	-14.2		359	5,768	-12.6		336	5,850	-8.6		361	5,686	-17.5		320	5,890	-6.6	
450-----	353	6,627	-16.5		362	6,479	-22.3		357	6,552	-19.8		357	6,573	-18.1		333	6,662	-13.9		360	6,475	-23.1		312	6,712	-11.9	
400-----	350	7,495	-22.8		358	7,329	-28.5		356	7,409	-26.2		357	7,434	-24.3		330	7,545	-19.9		359	7,319	-29.2		305	7,596	-18.0	
350-----	348	8,459	-29.9		354	8,272	-35.7		352	8,360	-33.4		355	8,392	-31.4		324	8,521	-26.9		358	8,259	-36.1		293	8,580	-25.0	
300-----	342	9,536	-38.1		348	9,326	-43.4		344	9,423	-41.3		352	9,467	-39.3		317	9,614	-35.0		357	9,311	-43.8		276	9,681	-33.4	
250-----	335	10,767	-47.1		328	10,531	-50.8		335	10,637	-49.5		350	10,691	-47.7		286	10,860	-44.5		355	10,514	-51.5		262	10,933	-43.3	
200-----	325	12,216	-55.8		315	11,964	-55.0		326	12,071	-53.3		346	12,138	-50.9		266	12,317	-55.1		355	11,943	-56.5		234	12,399	-54.4	
175-----	322	13,059	-52.6		309	12,815	-53.5		319	12,913	-58.2		342	12,985	-57.7						351	12,788	-56.8		211	13,241	-60.3	
150-----	320	14,013	-63.4		297	13,793	-56.2		310	13,875	-60.1		340	13,950	-60.3						340	13,762	-57.4		189	14,187	-66.6	
125-----	305	15,120	-67.1		284	14,945	-57.9		297	15,002	-62.4		330	15,076	-63.3						329	14,909	-58.6					
100-----	282	16,457	-69.4		255	16,345	-59.0		273	16,373	-64.1		312	16,439	-65.4						306	16,304	-59.5					
80-----	247	17,785	-68.6		227	17,742	-58.4		247	17,735	-63.4		282	17,795	-64.6						285	17,701	-59.3					
60-----	201	19,524	-64.1		191	19,557	-56.8						227	19,567	-61.7													
50-----	178	20,645	-61.3										192	20,700	-59.5													
40-----	144	22,040	-57.8																									

Standard pressure surface (mb.)	MIAMI, FLA. (1017 MB.)				NANTUCKET, MASS. (1014 MB.)				NASHVILLE, TENN. (997 MB.)				NORTH PLATTE, NEBR. (916 MB.)				OAKLAND, CALIF. (1017 MB.)				OKLAHOMA CITY, OKLA. (970 MB.)				OMAHA, NEBR. (980 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	365	4	23.5	79	365	14	9.8	87	365	177	15.3	70	363	848	9.7	68	365	6	14.1	74	365	391	15.3	68	365	300	11.5	68
1,000---	365	149	23.2	75	365	130	11.0	76	365	145			363	108			365	147	13.7	70	365	125			365	127		
950----	365	596	20.4	71	365	559	10.1	66	365	583	15.4	54	363	546			365	585	13.8	56	365	565	16.7	56	365	559	11.8	57
900-----	365	1,061	17.5	71	365	1,006	7.9	62	365	1,039	12.7	54	363	996	11.4	57	365	1,035	13.1	44	365	1,024	14.7	52	365	1,010	10.1	57
850-----	365	1,548	15.0	64	365	1,476	5.5	59	365	1,516	9.9	53	363	1,473	9.9	51	365	1,513	11.0		365	1,505	12.6	49	365	1,484	8.1	56
800-----	365	2,059	12.6	56	365	1,969	3.2	54	365	2,018	7.5		363	2,017	5.4	51	365	2,016	8.4		365	2,012	10.1	46	364	1,982	5.7	53
750-----	365	2,601	10.0	49	365	2,496	-8.9	49	365	2,552	4.8		363	2,507	4.1	51	365	2,552	5.5		365	2,552	7.2	42	364	2,511	2.9	50
700-----	365	3,169	7.1		365	3,042	-1.8	46	365	3,106	1.8		363	3,061	7.7	49	365	3,107	2.2		365	3,110	3.7	39	364	3,064	-3.4	47
650-----	365	3,777	3.7		364	3,632	-5.0		365	3,705	-1.6		361	3,658	-3.1	48	364	3,705	-1.5		364	3,713	-1.1	37	363	3,659	-3.8	45
600-----	364	4,421	-1.1		362	4,253	-8.5		364	4,333	-5.4		359	4,282	-7.3	46	364	4,335	-5.5		363	4,344	-4.3		360	4,282	-7.6	
550-----	364	5,111	-4.2		362	4,925	-12.6		362	5,014	-9.6		354	4,955	-11.9		364	5,012	-10.0		361	5,027	-10.1		360	4,954	-12.2	
500-----	363	5,857	-8.9		360	5,644	-17.2		356	5,740	-14.3		353	5,676	-16.9		363	5,740	-15.1		360	5,755	-13.6		360	5,676	-17.1	
450-----	363	6,673	-14.2		360	6,433	-22.5		359	6,539	-19.7		349	6,464	-22.6		360	6,535	-20.6		358	6,558	-19.2		357	6,465	-22.6	
400-----	362	7,549	-20.4		360	7,281	-28.3		358	7,395	-25.8		344	7,313	-28.9		359	7,390	-27.0		357	7,413	-25.5		356	7,312	-28.8	
350-----	361	8,523	-27.5		355	8,286	-35.0		357	8,348	-32.7		340	8,252	-35.9		357	8,337	-34.2		356	8,367	-32.6		352	8,253	-35.7	
300-----	359	9,612	-35.9		353	9,284	-42.2		357	9,415	-40.4		334	9,304	-43.5		353	9,398	-42.2		353	9,434	-40.4		346	9,309	-43.0	
250-----	356	10,852	-45.6		349	10,494	-49.6		355	10,634	-48.6		326	10,507	-50.9		351	10,608	-50.5		350	10,652	-48.8		340	10,518	-50.2	
200-----	354	12,303	-56.0		346	11,934	-55.1		352	12,079	-55.3		308	11,943	-55.7		348	12,040	-57.1									

# RADIOSONDE DATA

Average annual values

Table 20--Continued

YEAR 1953

Standard pressure surface (mb.)	SANTA MARIA, CALIF. (1009 MB.)				S. STE. MARIE, MICH. ( 986 MB.)				SPOKANE, WASH. ( 931 MB.)				SWAN ISLAND, W. I. (1013 MB.)				TACUBAYA, MEXICO ( 774 MB.)				TAMPA, FLA. (1017 MB.)				TATOOSH ISLAND, WASH. (1013 MB.)				
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	
SURFACE	364	71	12.8	76	360	221	4.8	84	363	722	10.9	60	365	10	26.3	82	351	2,306	17.1	54	365	7	20.8	82	364	31	10.1	86	
1,000----	364	143	13.3	72	360	121			363	122			365	122	25.8	80	351	50			365	152	21.5	76	364	134	9.8	82	
950-----	364	592	14.6	55	360	546	5.5	70	363	559			365	575	22.6	80	351	515			365	599	19.3	71	364	562	8.1	76	
900-----	364	1,032	14.8	39	360	983	3.6	68	363	1,008	10.3	54	365	1,042	19.8	76	351	995			365	1,060	16.7	69	364	1,005	5.7	73	
850-----	364	1,514	12.7	35	360	1,445	1.5	67	363	1,481	7.1	53	365	1,533	17.0	70	351	1,487			365	1,546	14.1	65	364	1,470	3.2	70	
800-----	364	2,020	10.1		360	1,932	- .6	63	363	1,976	3.5	55	365	2,049	14.4	63	351	2,021			365	2,055	11.7	58	364	1,960	.7	64	
750-----	364	2,559	7.1		360	2,450	- 3.0	59	363	2,502	- .2	56	365	2,598	11.9	54	351	2,574	15.5		365	2,602	9.2	50	364	2,481	- 1.9		
700-----	364	3,117	3.8		360	2,989	- 5.6	55	363	3,046	- 3.7	55	365	3,167	9.1		351	3,151	11.1		365	3,163	6.3		364	3,021	- 4.9		
650-----	364	3,719	.3		358	3,572	- 8.7	52	363	3,634	- 7.3	52	364	3,783	5.8		350	3,771	6.4		365	3,773	3.1		363	3,607	- 8.3	54	
600-----	364	4,352	- 3.6		356	4,183	-12.2	49	362	4,246	-11.1	49	363	4,429	2.2		350	4,417	1.7		364	4,411	- .7		361	4,219	-11.9	50	
550-----	364	5,034	- 8.2		356	4,846	-16.1	47	362	4,912	-15.2	47	362	5,127	- 1.8		349	5,118	- 2.8		364	5,105	- 4.8		358	4,882	-16.2	48	
500-----	364	5,767	-13.3		354	5,555	-20.8		361	5,623	-20.0		362	5,879	- 6.2		346	5,864	- 7.2		363	5,844	- 9.5		356	5,591	-21.0		
450-----	364	6,567	-19.2		353	6,332	-26.1		359	6,402	-25.5		362	6,702	-11.4		344	6,687	-12.2		360	6,663	-14.9		350	6,367	-26.4		
400-----	363	7,425	-25.8		351	7,169	-32.0		357	7,240	-31.5		360	7,588	-17.6		338	7,570	-18.0		356	7,532	-21.0		350	7,202	-32.4		
350-----	363	8,377	-33.3		349	8,099	-38.7		355	8,170	-38.5		358	8,573	-24.6		330	8,554	-25.0		353	8,504	-28.0		348	8,130	-39.3		
300-----	363	9,441	-41.4		349	9,142	-45.4		355	9,211	-45.9		355	9,675	-33.0		312	9,655	-33.4		349	9,593	-36.2		346	9,168	-46.6		
250-----	362	10,653	-50.1		344	10,343	-50.9		353	10,402	-52.9		352	10,929	-42.9		278	10,910	-43.3		345	10,833	-45.6		339	10,368	-53.2		
200-----	362	12,085	-57.0		332	11,785	-53.3		347	11,827	-55.6		351	12,395	-54.3		232	12,376	-54.5		340	12,286	-55.6		318	11,782	-55.3		
175-----	361	12,926	-59.1		317	12,645	-53.6		345	12,678	-54.9		344	13,238	-60.4						332	13,126	-60.4		314	12,633	-54.7		
150-----	357	13,887	-61.1		297	13,634	-54.4		341	13,661	-55.0		334	14,182	-67.0						328	14,075	-65.0		300	13,618	-54.5		
125-----	353	15,011	-63.7		263	14,801	-55.5		333	14,822	-55.8		298	15,266	-72.9						319	15,174	-69.0		282	14,784	-55.1		
100-----	339	16,371	-65.0						321	16,238	-56.3		268	16,558	-76.7						299	16,498	-71.6		256	16,204	-55.7		
80-----	317	17,731	-64.0						294	17,654	-56.2		210	17,841	-75.6						264	17,815	-70.6		223	17,625	-55.5		
60-----	281	19,505	-60.9						264	19,481	-55.4		178	19,532	-68.6						235	19,537	-66.2						
50-----	247	20,644	-58.7						228	20,643	-54.5																		
40-----	187	22,054	-56.4																										

VERACRUZ, MEXICO (1011 MB.)				WASHINGTON, D. C. (1007 MB.)				
Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	
SURFACE	350	13	26.0	77	364	88	12.7	71
1,000----	350	107	25.2	78	364	148	12.8	65
950-----	350	556	22.8	73	364	581	13.1	61
900-----	350	1,028	20.5	66	364	1,031	10.7	61
850-----	350	1,520	17.8	64	364	1,506	8.0	60
800-----	350	2,037	15.0	61	364	2,004	5.4	59
750-----	350	2,587	12.2	55	364	2,535	2.7	55
700-----	348	3,157	9.1	51	364	3,084	- .1	51
650-----	335	3,772	5.8		362	3,680	- 3.3	47
600-----	324	4,419	1.9		360	4,303	- 6.8	43
550-----	311	5,114	- 2.3		360	4,980	-10.8	
500-----	295	5,867	- 6.9		358	5,703	-15.4	
450-----	282	6,688	-12.1		357	6,498	-20.8	
400-----	269	7,574	-18.0		357	7,351	-26.9	
350-----	254	8,558	-24.9		356	8,299	-33.6	
300-----	239	9,662	-33.3		355	9,362	-41.0	
250-----	225	10,917	-43.1		354	10,579	-48.7	
200-----	205	12,384	-54.5		346	12,022	-54.7	
175-----	190	13,226	-60.6		340	12,869	-57.0	
150-----	168	14,173	-66.9		336	13,839	-58.9	
125-----	140	15,259	-72.7		325	14,975	-60.8	
100-----					300	16,352	-61.9	
80-----					267	17,732	-61.4	
60-----					225	19,521	-59.6	
50-----					206	20,664	-58.3	
40-----					191	22,074	-56.5	
30-----					169	23,904	-54.6	

Note: All observations scheduled at 0300, G.C.T. except at Wenatchee, Merida and Veracruz, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and

expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.



## Average annual resultant winds

YEAR 1953

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

# RAWIN DATA

Average annual resultant winds

YEAR 1953

Table 22

Altitude (meters) m. s. l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed				
Surface-----	364	108	0.7	304	148	3.5	357	38	0.4	363	117	3.3	365	105	1.0	363	268	1.5	363	203	0.7	365	155	0.7	364	38	0.7	362	252	0.6	354	243	1.0	
500-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
1,000-----	---	---	---	304	164	5.0	352	287	2.1	356	143	4.3	357	121	9	363	278	5.0	357	246	2.8	360	239	4.0	---	---	---	---	---	---	---	---		
1,500-----	---	---	---	304	189	5.1	348	286	3.9	357	157	2.6	354	189	4	354	284	6.1	355	260	3.2	360	256	5.3	359	39	5	358	265	4.6	336	272	4.7	
2,000-----	364	265	2.2	303	218	4.6	346	268	5.6	357	192	1.0	344	245	1.0	350	280	7.1	348	268	3.9	360	265	6.3	359	244	1.4	355	272	5.2	326	279	5.4	
2,500-----	364	273	4.3	303	241	4.8	344	291	7.1	358	230	2.0	338	256	2.0	349	276	8.1	345	270	5.1	358	272	7.2	359	247	2.7	350	274	6.3	323	278	6.6	
3,000-----	363	273	5.3	303	255	5.6	340	294	8.5	357	248	3.0	334	265	3.3	345	274	8.9	339	271	6.2	357	274	8.4	360	253	3.9	347	273	7.2	315	276	7.3	
4,000-----	361	279	6.6	297	268	6.9	329	293	10.4	351	260	4.6	335	265	5.8	330	272	11.0	315	268	7.9	348	278	9.8	359	271	4.9	335	273	8.9	298	275	9.1	
5,000-----	350	281	7.8	283	273	8.0	309	290	12.5	345	260	6.2	330	264	7.7	321	272	12.6	295	270	8.9	340	280	11.7	354	277	6.6	325	274	11.1	284	273	10.4	
6,000-----	332	279	8.6	268	273	8.9	285	288	12.9	329	261	7.4	328	265	9.7	308	269	14.1	271	272	9.0	321	280	12.6	343	281	8.9	302	274	12.6	254	273	10.6	
8,000-----	281	277	9.9	238	272	10.0	243	279	15.8	285	264	9.9	301	264	12.5	264	269	16.1	286	279	15.6	284	280	10.6	---	---	---	---	---	---	---	---	---	
10,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12,000-----	238	276	11.5	---	---	---	185	275	16.0	---	---	---	258	265	14.4	208	266	19.6	---	---	---	229	275	18.6	---	---	---	226	279	11.8	---	---	---	
14,000-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	164	264	17.7	---	---	---	---	---	---	---	---	---	162	273	14.6	---	---	---	

Altitude (meters) m. s. l.	Internat'l. Falls, Minn. (358 m.)			Little Rock, Ark. (80 m.)			Medford, Ore. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (316 m.)			San Antonio, Tex. (242 m.)			
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed				
Surface-----	360	223	0.4	365	184	0.5	365	307	1.2	365	101	1.4	352	255	1.3	364	230	0.7	364	276	2.4	361	137	2.4	365	350	1.5	363	282	0.3	365	104	2.4	
500-----	358	238	1.1	364	196	2.5	360	306	1.5	365	120	3.1	342	265	5.2	354	220	1.8	360	293	3.7	331	149	2.7	---	---	---	355	256	1.2	363	125	4.5	
1,000-----	358	266	3.0	363	222	3.1	360	287	1.8	365	129	2.5	339	273	6.0	354	238	3.2	361	298	3.5	329	190	3.9	356	351	1.3	352	268	3.4	363	148	4.2	
1,500-----	352	285	4.3	356	242	3.6	360	256	2.4	365	157	1.6	338	274	6.9	355	254	3.9	361	299	3.1	324	231	4.1	355	302	2.8	348	260	5.0	359	180	2.6	
2,000-----	348	294	5.6	351	258	4.3	359	246	3.6	363	198	1.6	330	274	7.7	354	263	5.0	362	296	3.2	329	258	4.9	357	295	4.7	344	265	6.5	357	224	2.8	
2,500-----	346	296	6.8	343	271	5.1	356	250	5.1	363	224	2.1	331	270	9.3	352	272	6.0	363	291	3.6	337	266	6.0	358	291	6.6	339	290	7.5	358	247	3.5	
3,000-----	342	296	7.9	337	276	6.2	355	256	6.3	363	236	2.8	327	270	10.7	352	276	7.1	360	288	4.2	336	274	6.9	357	292	8.1	340	289	8.6	357	259	4.6	
4,000-----	336	295	10.2	320	282	7.6	346	266	7.8	360	252	4.1	308	270	12.5	347	277	9.3	357	286	6.5	334	276	8.4	347	289	10.6	331	288	10.3	349	268	6.4	
5,000-----	325	293	12.6	297	286	8.4	334	269	9.4	355	261	5.6	281	265	13.5	333	275	11.1	347	282	8.4	323	278	9.7	328	285	12.3	325	315	17.2	333	271	7.6	
6,000-----	309	292	14.7	271	286	8.6	297	270	10.7	350	265	7.2	---	---	---	307	277	11.7	330	282	10.1	309	272	10.9	311	282	13.1	307	286	13.9	309	268	9.1	
8,000-----	259	288	17.6	---	---	---	230	265	11.6	345	271	11.1	---	---	---	266	275	13.7	274	273	12.1	271	271	12.3	272	278	15.0	274	284	15.8	273	266	12.5	
10,000-----	191	285	17.8	---	---	---	---	---	---	320	273	13.2	---	---	---	---	---	---	213	273	13.2	235	271	13.7	---	---	---	217	268	16.0	218	279	17.8	
12,000-----	---	---	---	---	---	---	---	---	---	295	274	16.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	165	269	17.3	150	277	17.4
14,000-----	---	---	---	---	---	---	---	---	---	249	282	12.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	

Altitude (meters) m. s. l.	San Juan, P.R. (26 m.)			Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)			Washington, D.C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface-----	365	106	2.8	365	283	1.9	359	276	0.3	363	204	1.7	350	191	2.3	365	219	0.4
500-----	363	94	6.9	363	347	3.5	356	261	1.7	---	---	---	340	218	3.9	359	254	3.1
1,000-----	363	95	7.0	360	355	3.8	354	272	3.8	360	221	3.5	335	221	4.3	358	273	5.3
1,500-----	363	93	6.4	361	6	3.5	350	275	5.1	353	239	4.8	331	226	4.3	358	276	6.6
2,000-----	363	91	6.0	361	359	3.2	347	280	6.0	350	247	5.4	325	235	4.8	360	276	7.6
2,500-----	364	89	5.6	363	334	3.5	343	283	7.1	347	254	5.7	321	243	5.6	360	275	8.4
3,000-----	364	86	5.0	363	317	4.2	340	284	8.1	344	259	6.4	318	250	6.3	359	274	9.5
4,000-----	361	80	3.8	353	291	5.7	332	282	10.2	334	265	8.2	305	255	8.4	357	272	11.9
5,000-----	362	64	2.1	343	283	7.2	317	284	12.3	324	267	9.9	291	256	9.6	357	270	14.5
6,000-----	362	22	1.2	326	278	8.3	304	285	13.9	296	264	10.0	272	253	10.0	354	269	16.7
8,000-----	359	308	3.6	299	275	10.4	262	281	16.7	243	260	10.0	222	252	11.5	346	267	21.4
10,000-----	356	296	9.3	264	271	12.0	---	---	---	---	---	---	---	---	---	337	266	26.3
12,000-----	355	287	13.9	231	268	15.6	---	---	---	---	---	---	---	---	---	313	264	27.5
14,000-----	350	292	13.0	200	265	13.4	---	---	---	---	---	---	---	---	---	300	267	23.9
16,000-----	324	300	5.7	181	258	7.3	---	---	---	---	---	---	---	---	---	275	266	15.7
18,000-----	268	65	2.3	175	289	6	---	---	---	---	---	---	---	---	---	223	265	7.3
20,000-----	227	80	3.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
22,000-----	163	87	5.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

These free-air resultant winds are based on rawin observations made near 0300 G. C. T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in

meters per second. Annual values are not computed for any level having less than 10 monthly values or having more than 1 monthly value missing in a single season.



# SOLAR RADIATION DATA

Average daily values (direct and diffuse) received  
on a horizontal surface, tabulated in langleys.

YEAR 1953

Table 30

Station	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Aklavik, MacKenzie	6	46	211	388	497	500	467	280	145	51	13	---	---
Albuquerque, N. Mex.	341	409	534	639	724	745	690	671	619	471	348	296	541
Annette Island, Alaska	---	---	---	---	---	---	---	---	---	---	---	---	---
Apalachicola, Fla.	317	337	466	522	---	---	---	---	---	446	324	242	---
Astoria, Ore.	*	214	328	403	472	489	603	439	365	238	94	73	---
Atlanta, Ga.	224	294	405	554	563	583	549	588	463	411	280	214	427
Barrow, Alaska	---	30	181	409	---	---	---	200	142	54	---	---	---
Bethel, Alaska	40	106	309	451	427	496	483	250	207	140	53	23	249
Big Spring, Tex.	---	---	---	---	584	605	563	478	534	394	**	---	---
Bismarck, N. Dak.	---	---	---	427	489	534	685	527	414	275	159	113	---
Blue Hill, Mass.	191	226	265	354	456	655	---	452	403	240	148	124	---
Boise, Idaho	147	288	381	493	564	657	720	577	461	296	156	117	405
Boston, Mass.	137	210	229	305	---	---	---	---	355	---	---	---	---
Brownsville, Tex.	398	349	468	516	565	698	681	530	539	391	311	228	473
Canton Island, Pacific Area	---	---	---	662	541	606	600	693	692	688	651	617	---
Caribou, Me.	---	---	---	354	496	534	(543)	436	312	218	98	86	---
Charleston, S. C.	381	298	394	557	631	583	(559)	482	410	351	276	195	426
Cleveland, Ohio	---	---	245	336	471	648	---	---	---	---	---	---	---
Columbia, Mo.	---	---	386	437	548	652	639	530	562	374	296	---	---
Columbus, Ohio	99	231	260	336	486	606	608	559	468	328	205	160	362
Davis, Calif.	183	336	429	525	596	671	688	616	516	382	178	193	443
Dodge City, Kans.	---	---	424	607	622	680	630	609	522	366	255	228	---
East Lansing, Mich.	82	135	185	300	400	470	459	416	331	235	122	86	278
East Wareham, Mass.	130	205	267	313	411	597	494	(463)	410	236	170	150	321
Edmonton, Alberta	86	172	306	367	476	534	518	(432)	319	199	89	56	296
El Paso, Tex.	378	434	558	661	734	741	688	666	633	480	414	344	561
Ely, Nev.	---	---	518	579	639	744	635	672	534	401	250	226	---
Fairbanks, Alaska	24	67	247	418	---	501	510	328	213	94	29	6	---
Fort Worth, Tex.	349	365	469	567	619	759	617	575	595	414	303	---	---
Fresno, Calif.	232	393	527	620	713	786	770	703	563	444	260	232	520
Glasgow, Mont.	---	---	---	460	574	635	751	591	461	---	---	---	---
Grand Junction, Colo.	246	369	---	---	616	737	672	606	563	403	266	237	---
Grand Lake, Colo.	183	310	432	492	610	687	582	---	---	---	---	---	---
Great Falls, Mont.	131	217	410	---	410	---	---	---	435	313	183	123	---
Greensboro, N. C.	---	297	370	507	549	561	599	502	465	369	266	194	---
Griffin, Ga.	189	281	398	535	554	528	501	564	485	421	286	184	411
Hatteras, N. C.	229	285	426	595	640	656	(603)	505	460	351	272	213	436
Indianapolis, Ind.	116	251	306	356	475	594	587	520	449	323	200	144	360
Inyokern, Calif.	305	410	557	663	766	828	754	727	640	500	358	310	568
Ithaca, N. Y.	97	219	248	300	410	588	560	495	392	287	144	92	319
Jeanerette, La.	---	---	---	---	---	---	---	---	---	---	---	---	---
Keflavik, Iceland	9	50	108	---	396	410	---	---	---	---	---	---	---
Lake Charles, La.	---	260	392	514	539	681	539	540	553	437	314	214	---
Lander, Wyo.	226	---	---	589	594	738	670	585	528	344	246	190	---
Las Vegas, Nev.	316	438	589	668	791	---	644	672	590	445	315	282	---
Lincoln, Nebr.	188	255	338	388	510	568	569	552	482	351	185	166	379
Little Rock, Ark.	219	312	364	501	525	655	564	586	550	383	282	219	430
Los Angeles, Calif. (WBAS)	293	418	551	559	739	692	716	634	501	454	319	299	514
Los Angeles, Calif. (WB0)	248	380	472	487	637	596	653	587	484	392	284	261	457
Madison, Wis.	124	210	290	363	482	589	523	504	442	291	---	118	---
Medford, Ore.	107	250	353	509	487	(689)	794	599	490	296	132	88	400
Miami, Fla.	363	432	570	579	665	528	(600)	483	395	335	302	297	462
Nashville, Tenn.	176	280	358	468	532	---	---	---	---	367	258	190	---
Newport, R. I.	142	---	276	318	396	575	484	439	397	247	179	157	---
New York, N. Y.	---	---	259	354	398	604	589	490	429	274	160	132	---
Oak Ridge, Tenn.	124	231	320	421	476	560	488	491	455	355	227	148	358
Oklahoma City, Okla.	310	371	452	560	549	---	---	---	558	347	282	242	---
Ottawa, Ontario	125	250	(283)	394	(581)	630	(598)	(545)	(381)	287	125	88	357
Phoenix, Ariz.	340	439	547	661	753	763	645	658	606	471	339	303	544
Portland, Me.	---	---	---	468	542	687	(634)	547	464	354	---	---	---
Prosser 4NE, Wash.	---	---	---	482	624	665	760	586	479	308	141	106	---
Put-in-Bay, Ohio	100	213	258	338	438	556	516	---	---	---	---	---	---
Rapid City, S. Dak.	166	269	432	529	600	560	556	510	350	206	143	396	---
Riverside, Calif.	285	411	515	465	672	672	639	643	544	452	319	301	493
St. Cloud, Minn.	---	---	---	---	---	---	---	---	---	---	---	---	---
Salt Lake City, Utah	156	265	360	458	527	690	632	---	---	---	---	---	---
San Antonio, Tex.	390	386	407	521	601	699	684	---	---	---	---	---	---
Santa Maria, Calif.	287	431	497	491	647	745	710	643	504	453	311	301	502
Sault Ste. Marie, Mich.	110	210	313	381	554	564	639	---	---	---	---	93	---
Sayville, N. Y.	148	266	297	395	432	630	598	508	453	281	166	134	359
Schenectady, N. Y.	111	200	239	290	380	545	476	397	317	235	140	96	286
Seabrook, N. J.	149	247	321	389	469	576	596	476	452	309	191	148	360
Seattle-Tacoma AP, Wash.	44	142	240	364	478	488	584	457	337	201	88	52	290
Seattle (Univ. of W.), Wash.	51	135	225	306	376	384	501	437	332	185	86	51	256
Spokane, Wash.	---	---	---	---	---	---	---	---	---	---	---	---	---
State College, Pa.	122	242	280	357	444	573	582	469	398	323	181	115	341
Stillwater, Okla.	261	342	421	508	539	651	582	550	532	350	280	244	438
Swan Island, W. I.	416	504	594	622	594	520	(548)	571	524	430	340	344	501
Tampa, Fla.	371	443	576	610	705	573	609	518	422	432	337	304	492
Toronto, Ontario	101	---	---	---	460	539	535	480	374	250	127	---	---
Upton, N. Y.	191	250	287	405	430	653	583	490	444	297	182	156	364
Wake Island, Pacific Area	---	---	---	---	---	---	---	---	---	---	---	+209	---
Washington, D.C. (Amer. U.)	213	262	333	394	458	492	569	---	---	---	---	160	---
Washington, D.C. (Silver Hill)	---	---	---	---	---	---	---	x	447	320	232	96	330
Winnipeg, Manitoba	110	241	326	448	465	502	617	486	326	227	120	---	---

Note: Langley is the unit used to denote one gram calorie per square centimeter.

- \* First report Astoria, Jan. 24, 1953.
- \*\* Station moved from Big Spring to Midland, Tex., Nov. 11, 1953.
- First report Prosser 4NE, Wash., Apr. 2, 1953.
- x Last report American University, Aug. 6, 1953.
- First report Silver Hill, Md., Aug. 21, 1953.
- First report Wake Island, Dec. 11, 1953.

# SOLAR RADIATION DATA

Table 33.--Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleyes.

1952		1953		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Keflavik, Iceland		Kef	
------	--	------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-------------------	--	-----	--





Chart I. Departure from Normal of Annual Average Temperature ( $^{\circ}\text{F.}$ ) at Surface, 1953.

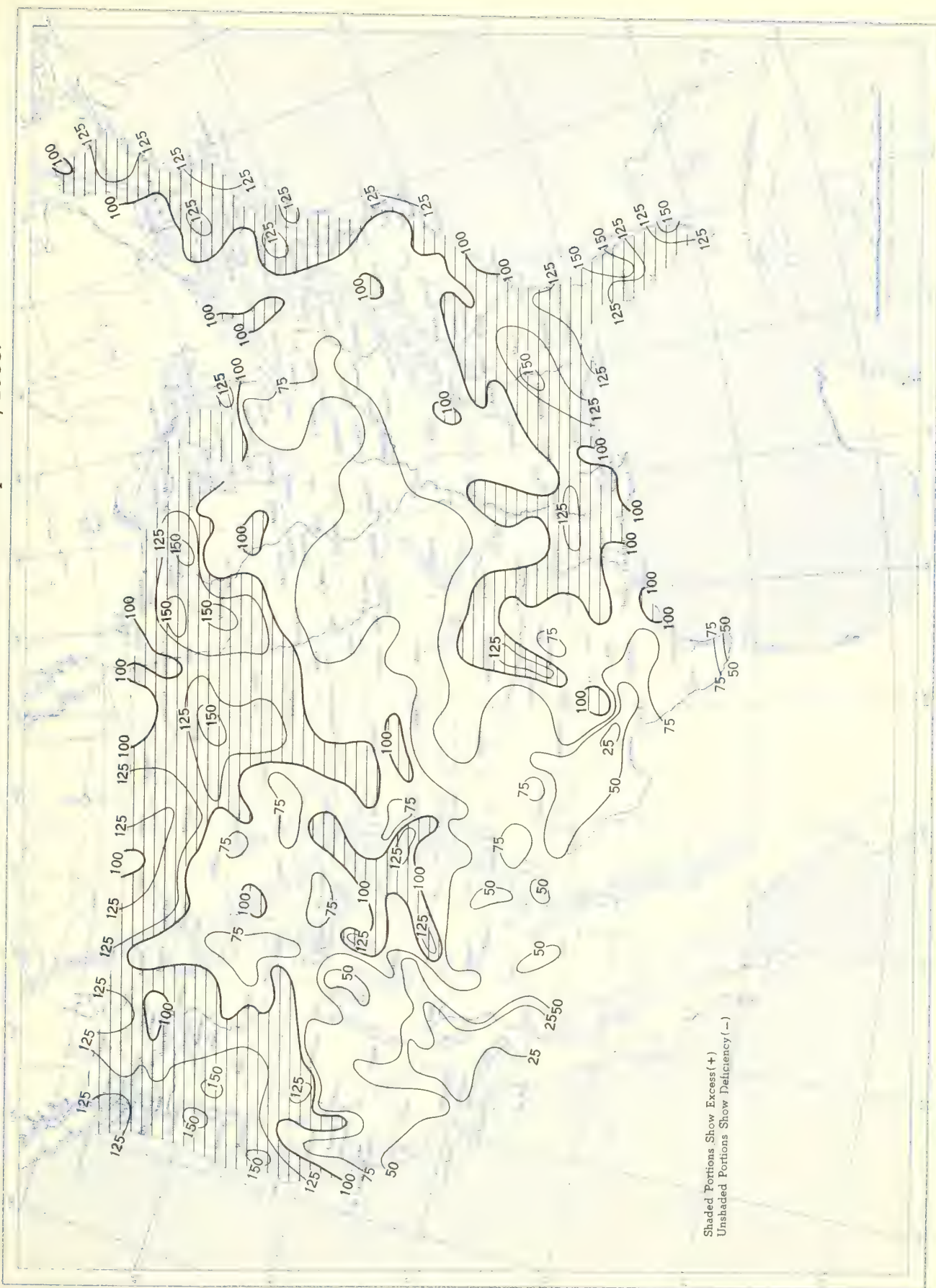


Shaded Portions Show Excess (+)  
Unshaded Portions Show Deficiency (-)





Chart II. Percentage of Normal Annual Precipitation, 1953.



Shaded Portions Show Excess (+)  
Unshaded Portions Show Deficiency (-)





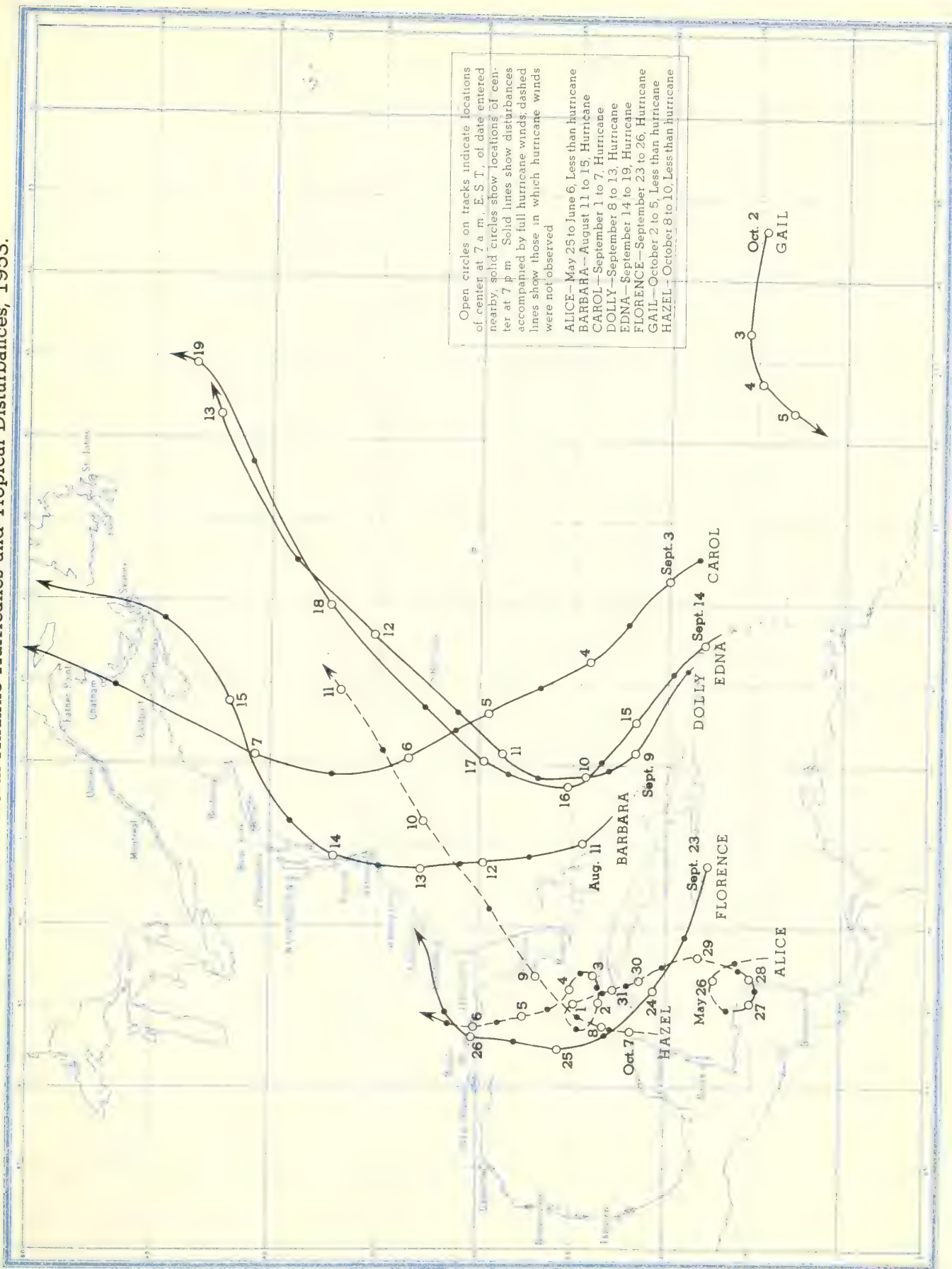
Chart III. Tracks of Tornadoes, 1953.







Chart IV. Tracks of North Atlantic Hurricanes and Tropical Disturbances, 1953.





U. S. Department of Commerce WEATHER BUREAU NWRG - Asheville, N. C.	OFFICIAL BUSINESS Permit No. 1024
---	--------------------------------------

Clemson College Library  
Clemson  
South Carolina

CD

Penalty for private use to avoid pay- ment of postage \$300.
---

2

















